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Introduction

Marián Kabát, Katarína Bodišová

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Every conference should present possibilities to share research, ideas, and to explore new paths and possibilities. This was also the case with the *Translation, Interpreting & Culture* (TIC) conference held at Comenius University in Bratislava, Slovakia from September 20 to September 22, 2023. The third installment of the conference was themed *Virality and Isolation in the Era of Deepening Divides*. We believe that the conference proved its point – isolation is not the answer, in an era of fast technological progress, automation, and AI, networking and thoughtful discussions are what will connect the T&I community, and help it face every challenge it faces (more on this in the discussion *Translation Automation and Sustainability* by Joss Moorkens, Sheila Castilho, Federico Gaspari, Antonio Toral, Maja Popović).

The TIC 2023 conference welcomed over 80 academics from more than 20 countries. This issue of *L10N Journal* presents selected papers which focus on both, the conference and journal themes.

The first article by Márta Lesznyák, Eszter Sermann, and Mária Bakti delves into post-editing skills and competencies of students and looks at the time needed to process a task and the quality of the output. Following that, João Brogueira presents a sociological exploration of Portuguese translators and their stance towards machine translation. The third article by Irene Fuentes Pérez explores translation project management in Spain. The author focuses on the training and work-related skills of possible candidates. In the last article, Dainora Maumevičienė explores machine translation functions and limitations in software localization.

The articles in this issue present viewpoints from various areas of translation, and we, the editors, hope that they too will lead to more networking and thoughtful discussions just as the TIC 2023 conference did. And we hope that we will meet again at one of the future installments of the conference.

Kabát, Marián and Bodišová, Katarína. 2023. Introduction. In: L10N Journal. 2(2), pp. 4–5.

Bibliography

Moorkens, Joss, Castilho, Sheila, Gaspari, Federico, Toral, Antonio, and Popović, Maja. 2024. *Roundtable: Translation Automation and Sustainability*. In: The Journal of Specialised Translation, no. 41. <https://doi.org/10.26034/cm.jostrans.2024.4737>.

Articles

Translation and post-editing performance of translation students – a cross-sectional analysis

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Abstract

This study presents partial results of a comprehensive study to reveal what role PACTE's translation sub-competences play in human translation and in the post-editing of machine translated texts. In the PACTE model, both language competence and background knowledge related to the source text are given a prominent role. The present research explores how these factors are associated with MA students' translation performance. 20 first-year and 27 second-year master's students of translation (University of Szeged, Hungary) translated or post-edited the abstract of a study on bilingualism from English to Hungarian and completed a test measuring their relevant thematic knowledge and language tests assessing their source language competence. Our analysis focuses on comparing the quality of translated and post-edited texts, and on the time needed to complete the target text. The correlations between test scores, on the one hand, and error types and error numbers in the translated and post-edited Hungarian target language texts, on the other hand, are also examined. Our results indicate that both at the beginning and at the end of the training, post-editing was faster than human translation and post-edited texts contained fewer errors than human translations. In the second-year sample, thematic knowledge and time on task showed significant correlations with performance indices.

Keywords: human translation, post-editing, translation competence, background knowledge, source language competence

Introduction

With the advent of modern technologies in the language mediation industry, post-editing of machine translation (MT) output has become an industry norm (Domingo et al. 2020). The overall aim of the comprehensive investigation of the Translation Competence Research Group at the University of Szeged, Hungary, is to reveal what role PACTE's translation sub-competences play in human translation (HT) and the post-editing of MT. The research presented here examines the role of source language (SL)

competence (in this case English) and background knowledge related to the topic of the SL text play in the quality of HT and post-editing of MT.

First, a literature review is provided, focusing on translation competence, background knowledge and SL sub-competences, and on the comparison of post-editing and human translation.

Next, the Szeged Translation Competence Research Project is described, and the methodology of the present investigation is detailed, followed by the presentation and discussion of the results and a summary.

1 Literature review

1.1 Translation competence

Mapping and understanding translation competence is a vibrant research field in Translation Studies; competence models range from minimalist definitions (Pym 2003) to elaborate multicomponent models. Some of these multicomponent models focus on professional translators, such as TransCert (Krajcso 2018) or the PACTE Model, while others tend to focus on translator training, for example, the EMT model (EMT 2022). In spite of the differences in focus, these models share several common components.

In our investigation, we use the translation competence model of the PACTE Group (PACTE 2003, 2008, 2014; Hurtado Albir 2017) and their definition of translation competence. The PACTE group defines translation competence as ‘the underlying system of knowledge, abilities and attitudes required to be able to translate’ (Hurtado Albir 2017, 320). Translation competence has both declarative and procedural knowledge components and is made up of five sub-competences, and extra psycho-physiological components (PACTE 2008, 2017a). The following sub-competences are considered parts of translation competence: 1) bilingual sub-competence, 2) extra-linguistic sub-competence, 3) knowledge about translation, 4) instrumental sub-competence and 5) strategic sub-competence. Additional psycho-physiological components are made up of cognitive components, attitudinal aspects, and abilities. Cognitive components comprise memory, perception, and attention; attitudinal aspects include, among others, intellectual curiosity, perseverance, motivation, and the ability to assess one’s own skills; while abilities listed are creativity and logical reasoning (PACTE 2008, 106, PACTE 2017a, 39-40).

In addition to PACTE’s Translation Competence project, the research group also carried out the Acquisition of Translation Competence (ATC) project. PACTE conceives the acquisition of translation competence as a dynamic, spiral process, leading from novice knowledge or pre-translation competence to expert knowledge or translation competence (PACTE 2014, 92-93, PACTE 2017b, 303-305). In the course of this process,

translator trainees integrate, develop, and restructure both procedural and declarative knowledge. Translation sub-competences are thought to develop in an inter-related fashion, sometimes compensating for each other.

By today, post-editing has become a norm in the translation industry (Domingo et al. 2020), however, competences related to post-editing have not been incorporated into translation competence models, although the EMT model (2022) does mention post-editing under “Translation” the sub-competence. At the same time, competence models related to post-editing do exist, for example the post-editing competence model of Nitzke, Hansen-Schirra, and Canfora (2019). The model includes the four core competences of risk-assessment competence, strategic competence, consulting competence, and service competence. These are complemented by eight subsidiary sub-competences, which are bilingual and extralinguistic competence, instrumental competence, research competence, revision competence, translation competence, machine translation competence, and post-editing competence (Nitzke et al. 2019, 248-250).

Their revised PE competences model (Nitzke and Hansen-Schirra 2021) places more emphasis on errors and error handling. In addition to a basic translators’ skill set, error handling, MT engineering and consulting competences are included in the model. Error handling is highlighted for several reasons: post-editors have to be familiar with the differences between the error-types different MT systems produce, and, in addition, they have to be able to spot and correct these errors (Nitzke, Hansen-Schirra 2021).

1.2 Background knowledge and source language competences

All of the multicomponent models of translation competence include a background knowledge or domain competence element (Krajcso 2018), referred to as *Thematic* competence in the EMT reference framework, *Domain-specific skills* in the TransCert skill card, domain competence in the ISO 17100:2015, and *extra-linguistic sub-competence* in the PACTE model. Some authors argue for the importance of general knowledge in translator training as a basic problem solving tool (Collombat 2006), while others argue for the importance of specific background information related to the translation task (Kim 2006).

However, there is a lack of empirical investigations that try to find relations between background knowledge in a specific field and translation/post-editing performance in that particular field.

Similarly, language competence-related empirical investigations are scarce in the field of Translation Studies. Although trainers and practitioners agree on the outstanding role of language competence in translation, few studies offer empirical evidence for it. Only some authors have dealt with the problems of L1, L2, or L3 language skills among students of translation (e.g., Neubert 2000, Pym 1992).

Using a style-based grammaticality judgement task, Ureel and his colleagues (2021) have mapped the development of the L2 sociolinguistic competence of translation trainees. The results highlight the need to develop students' sensitivity to grammatical (in)formality in translation training.

Do Carmo and Moorkens (2020) report in their study on post-editing that post-editors spend most of the time on pauses and not on keyboard actions, which, in their view, might show that PE is more closely linked to reading than to writing. They also add that PE might require more complex reading skills than translation from scratch.

1.3 Post-editing and human translation – productivity, quality and error types

As post-editing has become an industry norm (Domingo et al. 2020), research interest in PE has soared. Empirical research in the field primarily focuses on the topics of

- (a) the productivity of post-editing, operationalized as the amount of time needed to produce the final version of the target text (TT);
- (b) the quality of the post-edited text, often compared to the quality of human translations;
- (c) errors specific to, or more characteristic of, post-edited texts.

Productivity is a key issue in MT and PE; one of the reasons for their development and implementation is to save money or effort with their use. Numerous studies have been published on the three aspects of post-editing efforts, which were originally defined by Krings (2001): temporal effort, cognitive effort and technical effort.

The temporal effort in PE is usually mapped using keylogging or screen recording; the output measures are translated words per hour or the total amount of time needed to translate a specific text. The results of studies on the time needed for post-editing tend to support its temporal efficiency (e.g., Plitt and Masselot, 2010; Aranberri et al. 2014, Carl et al. 2015; Daems et al. 2017), however, other studies failed to find differences in the speed of PE and HT (García 2010, Carl et al. 2011), and many highlighted that some variables of the translation setting had an outstanding impact on PE time.

Many studies investigating the *quality* of post-edited texts have not found any difference between PE and HT (García 2010, Daems et al. 2017, Jia et al. 2019, Screen 2019). Contrary to publicly held beliefs about the poorer quality of post-edited TL texts, Fiederer and O'Brien (2009) found that post-edited translations scored slightly higher on clarity and accuracy than from-scratch translations, while from scratch translations were rated higher on style. Another study found that post-edited texts contained fewer errors than HT (Plitt and Masselot 2010). These results lead us to conclude that post-editing and human translation seem to produce target texts of comparable quality. It

has to be noted, though, that the studies surveyed had small sample sizes, leading to statistically not significant differences.

One way to express the quality of translations and post-edited texts is through error numbers and error types. Lately there has been a growing interest among researchers to describe the characteristics of post-edited texts and to identify error types that are more common in PE than in HT. Studies that have revealed such differences include Čulo and Nitzke (2016), who found that HT texts were characterized by more accurate terminology use than PE texts; Carl and Schaeffer (2017), who suggested that PE might lead to more literal translations than HT; and Bangalore et al. (2015), who reported that sentences in PE show less syntactic variation than in HT. Finally, Toral (2019) has shown that PEs are characterized by simplification, normalization and interference. Others, for example Daems et al. (2017), reported no evidence of post-editedness in their study.

Most of the above results are connected to Statistical Machine Translation (SMT); however, there has been a fundamental change in MT and the post-editing of machine translation with the appearance of neural machine translation (NMT). NMT produces more fluent target language texts, which, however, do not always accurately convey the meaning of the SL text correctly (Guerberof Arenas, Moorkens 2019; Martindale, Carpaut 2018). This has serious consequences for the productivity of post-editing, the quality of post edited texts, errors in post-edited texts and translators' attitudes toward MT and PE. NMT errors are reported to be more similar to human errors, whereas SMT errors have a complementary nature compared to both NMT and human errors (Yamada 2019). As a result of the similarity between human and NMT errors, post-editors are less likely to find errors in NMT outputs.

1.4 The Szeged Translation Competence research project – aims and objectives

The data analyzed in this paper form part of the Szeged Translation Competence Research Group's comprehensive research project. The aim of the project is to investigate what role the elements of translation competence (PACTE) play in human translation (HT) and in the post-editing of machine translation (PE). The following variables are included and operationalized in the project: source language skills, thematic knowledge, declarative knowledge of translation, source language text type, translation experience, work mode (HT or PE), and students' perceptions of the advantages and disadvantages of working with HT or PE.

The project focused on MA students of translation and interpreting at the University of Szeged. At the beginning of their MA studies, students completed a language test, based on Cambridge Proficiency tests, to assess their English (B or C) language knowledge. The language test was made up of two parts. The students had to fill in a Reading test,

with two multiple-choice tasks and one test with missing paragraphs. The Use of English test included two gap-filling exercises and one sentence transformation task. In addition to the language test, the students also filled in a test on their beliefs about translation.

The tests were administered using Google Forms.

Also, at the beginning of their studies, students translated or post-edited a test on bilingualism (language direction: English to Hungarian), and filled in a domain-specific background knowledge test related to bilingualism to assess their extra-linguistic knowledge. It was a 10-item multiple choice test on bilingualism.

At the end of their studies, one group of MA students translated or post-edited a legal text from English into Hungarian and filled in a domain-specific background knowledge test to assess their extra-linguistic knowledge. It was a 10-item multiple choice test on copyright law.

Another group of the second-year MA students translated or post-edited the same text on bilingualism as they did at the beginning of their studies.

The background knowledge questionnaires were filled out online (Google Forms) within a given time frame (about 3 weeks before or after the time the translations were made).

Video recordings and key-log files were also made of the HT/PE protocols.

This research design has yielded a wealth of data, part of which is analysed and presented in this paper.

1.5 Research questions

In the present paper, we use data to answer the following research questions:

Is there a difference between the efficiency of translation and post-editing

- in 1st year translation MA students (at the beginning of their studies)?
- in 2nd year translation MA students (at the end of their studies)?

Is there a difference between 1st and 2nd year students' performance?

Do hypothesized background factors (language competence, subject competence, time to translate) show a relation to performance?

Efficiency in our study is conceptualized as temporal efficiency, that is, time taken to prepare the target text. Performance is operationalized as target text quality, which is expressed in error numbers.

2 Methodology

2.1 Participants and materials

20 first-year students (at the beginning of their studies – September 2020) and 27 second-year master’s students of translation (at the end of their studies – May 2022 and May 2023) formed the sample of the present investigation (see Table 1). The study had a cross-sectional design, although 6 students were involved in the data collection both as first- and as second-year students. It is important to stress here that at the University of Szeged, in Hungary, translator training takes place on master’s level exclusively, within the framework of a four-semester translator and interpreter training program. This means that 1st year master students can be seen as highly proficient language learners or language users, who have no experience in translation at all. Another important background information is that students’ training did not involve any explicit training in post-editing at the time of the data collection.

Table 1. *The sample of the present study*

	Human translator	Post-editor
1st year students	11	9
2nd year students	11	16

Translation and post-editing performance were assessed by a translation/post-editing task, in which the source text was a 127-word long English abstract on bilingualism, and the target language was Hungarian. English was the B or C language of the translator trainees, and Hungarian was their A language. As most students had a BA degree in modern philology and had courses in linguistics, they were familiar both with the topic (bilingualism) and the genre (abstract).

Students also completed a test measuring their relevant linguistic background knowledge, together with a language test, which was based on the Cambridge Proficiency Tests assessing their source language (English) competence. There was a three-section Reading test, with two multiple-choice sections and one test with missing paragraphs. The Use of English test included two gap-filling exercises and one sentence transformation task.

The domain-specific background knowledge of the students (extra-linguistic knowledge) was measured using a 10-item multiple-choice test on bilingualism.

The tests were administered using Google Forms.

2.2 The data collection procedure

Data collection took place in autumn 2020 and in spring 2022 and 2023. All the translations were prepared in a classroom setting, and there was a time limit of 120 minutes for the task, but that limit was never actually reached. Students had internet access and were allowed to use whatever sources and webpages they wanted to use. Nevertheless, students in the HT condition were instructed to refrain from MT. The MT output for the post-editors was produced by DeepL. At the time of the data collection DeepL already used NMT. Students were asked to produce a target text of publishable quality (i.e., full post-editing of the MT output), without using TM software. Students worked in Translog, as data was collected on the translation/post-editing process, too. In addition, OBS Studio was used to record the computer screen while students were working on the translation/post-editing task.

To establish time on task, video recordings were used. The length of the translation/post-editing process was counted from the moment the ‘start logging’ button was pushed in Translog until the ‘stop logging’ button was pushed.

Students filled in the Google Forms tests online within a given timeframe (about 3 weeks before or after the time the translations were made).

2.3 Methods of data analysis

The quality of the target texts was evaluated by two raters (the researchers) with the help of MQM-based error categories. Multidimensional Quality Metrics (MQM, <https://themqm.org/introduction-to-tqe/>) is a translation evaluation system that can be applied to both human and machine translation. A major advantage of MQM is its flexibility. The typology contains seven high-level dimensions with further error sub-categories (e.g., dimension = Accuracy, one of its subtypes = mistranslation). The actual error categories can be adjusted to the needs of the actual user. MQM is widely used in the language industry and in translation research.

The categories used in this study were accuracy, fluency, style, and terminology. In addition, total error scores were also calculated. After checking inter-rater reliability, the mean values of the 2 raters’ error numbers were calculated for each error category, and these mean values were used in all further analysis.

In addition to error numbers, language test scores and bilingualism test scores (i.e., thematic/subject knowledge scores) were included in the analysis together with data on the time taken to prepare the translation. Statistical analyses were carried out with SPSS v. 24. Statistical analyses involved comparing human translators’ and post-editors’ performance, comparing students at the beginning and at the end of their studies, and testing correlations between test results and the number of errors in the target language text.

3 Results

3.1 Differences between post-editors and human translators

Independent samples t-tests were carried out to check whether there were significant differences between the efficiency of translators and post-editors. First-year and second-year students were handled as different sub-samples and thus, t-tests were performed for each group separately.

In the first-year sample (n = 19) no significant differences were found in the time taken to produce the target texts (human translators: M = 53.6 min., SD = 15.5; post-editor: M = 52.2 min, SD = 10.25, $t(17) = 0.22$, $p = .83$). As for the quality of the translations, no significant differences were found in most factors. However, differences in error numbers were significant in Style (human: 7.95 – post-editor: 6.12) and marginally significant in the Total number of errors (human = 25.04 – post-editor = 21.31). As can be seen in Table 2, it was the post-editors who made fewer errors.

Table 2. *Significant differences between human translator and post-editor performance in the first-year sample. Results of the independent samples t-test*

	Human translators		Post-editors		t-test	p
	M	SD	M	SD		
Style errors	7.95	1.83	6.12	2.04	2.04	.054
Total number of errors	25.04	3.60	21.31	4.66	1.97	.065

note: M = mean, SD = standard deviation

Similarly to the first-year student sample, no significant differences were found in the second-year group (n = 27) between the time needed to translate and the time needed to post-edit the text (human: M = 42.95 min., SD = 8.20; post-editor: M = 37.48 min, SD = 9.50, $t(23) = 1.50$, $p = 0.15$). However, a number of significant differences were found in error numbers, and they show that post-editors, again, outperformed translators in accuracy, fluency, and overall quality (see Table 3).

Table 3. *Significant differences between human translator and post-editor performance in the second-year sample. Results of the independent samples t-test*

	Human translators		Post-editors		t-test	p
	M	SD	M	SD		
Accuracy errors	8.31	3.08	6.44	1.72	2.03	.053
Fluency errors	4.90	3.19	2.50	1.45	2.34	.037
Total number of errors	22.77	4.03	18.75	3.36	2.82	.009

note: M = mean, SD = standard deviation

3.2 Differences between first-year and second-year students

A series of independent samples t-tests were performed to determine whether there are significant differences in speed and performance between first-year and second-year students. Again, differences were checked separately in the human translator and in the post-editor groups.

As Tables 4 and 5 show, second-year students were significantly faster than first-year students both in the human translation and in the post-editing condition. Moreover, second-year human translators made significantly fewer errors in Style and Terminology, whereas second-year post-editors outperformed first-year students in fluency.

Table 4. *Significant differences between the performance of first-year and second-year students. Results of the independent samples t-test*

	First-year students		Second-year students		t-test	p
	M	SD	M	SD		
Human translators						
Time	53.6	15.51	42.2	8.02	1.95	.066
Style errors	7.95	1.84	5.77	1.78	2.83	.010
Terminology errors	4.86	0.90	3.77	1.20	2.43	.025
Post-editors						
Time	52.21	10.25	37.49	9.50	3.45	.002
Fluency errors	4.69	2.15	2.50	1.45	2.96	.007

note: M = mean, SD = standard deviation

3.3 The role of background factors in the second-year-student sample

Our third research question focuses on how background factors may be related to translation performance. To reveal possible relations, Pearson correlation coefficients were computed between the hypothesized background factors and the indices of performance. Correlations were only studied in the second-year sample, as the first-year sample was deemed to be too small for the analysis. The background factors involved in the analysis were reading competence, grammar competence, thematic knowledge (on bilingualism), and time taken to prepare the target text.

In the human translator subsample of the second-year student group, no significant correlations were found between any of the background variables and performance indices at all. However, there was a moderate, significant negative correlation between time and accuracy ($r(9) = -0.68$, $p < 0.05$), suggesting that the more time a human translator devoted to the task, the fewer accuracy errors they made.

A number of significant negative correlations were found in the post-editor group, all of them in the moderate category (see Table 5). Both Use of English and subject knowledge tests scores showed a negative correlation to the total number of errors, which means that higher grammar competence and an in-depth knowledge of bilingualism was accompanied by higher overall performance. Bilingualism tests scores were also negatively correlated with fluency errors and style errors. In addition, significant negative correlations were found between time and terminology errors, suggesting that more time on task resulted in a smaller number of terminology errors.

Table 5. *Significant correlations between background variables and translation performance in the second-year post-editor group*

Variables	Grammar competence (Use of English)	Subject knowledge (bilingualism)	Time on task
Total number of errors	-.58*	-.65**	n.s.
Fluency errors	n.s.	-.59*	n.s.
Style errors	n.s.	-.51*	n.s.
Terminology errors	n.s.	n.s.	-.66**

4 Discussion

Our first research question focused on the differences between translation and post-editing in relation to efficiency. The research question was studied in two samples: first-year students, who had no experience either in translation or in post-editing, and second-year students, who were about to complete their studies but had not received explicit training in post-editing. The efficiency indices involved in the study were translation/post-editing error numbers and time taken to complete the target texts.

In the first-year sample no significant difference was found between translators and post-editors in terms of time, but post-editors made significantly fewer errors overall, and fewer errors in style, in particular. This means that post-editing resulted in better quality target texts, although it did not decrease the time necessary to complete the task. The fact that these students had no prior experience with translation or post-editing leads us to the assumption that other individuals or professionals with high language proficiency but without training and experience in translation would show similar performance. In other words, post-editing MT would help them produce better quality target texts if they needed to translate something, but they could not save a considerable amount of time.

Although the studied populations were different, the findings also align with those of Friederer and O'Brien (2009), who found that post-edited texts got higher scores for accuracy and clarity, and with those of Plitt and Masselot (2010), whose results show

that post-edited texts contained fewer errors than target texts of HT. The results on the temporal aspects of human translation and post-editing are consistent with Garcia's (2010) and Carl et al.'s (2011) findings, who could not find differences between the two groups either.

Results in the second-year sample showed a similar pattern to the those in the first-year sample. That is, post-editing did not lead to any time gains, but it resulted in better performance: post-editors outperformed translators in accuracy, fluency and overall quality.

In summary, it can be argued that full post-editing, when carried out by students with no or little experience but with some subject knowledge, will lead to better quality target texts than traditional, from scratch translation. Nevertheless, no evidence was found for post-editing being faster.

The second research question focused on the differences between first-year and second-year students. Our findings indicate that second-year students work much faster than first-year students: the time gain was 11 minutes (20%) in the human translator group and close to 15 minutes (29%) in the post-editor group. However, this improved temporal efficiency was not accompanied by quality improvement. The total number of errors did not change significantly between the beginning of the first and the end of the second academic year. Interestingly, some types of errors did decrease significantly, namely style and terminology errors in the human translator group and fluency errors in the post-editor group. These results are of particular importance if we consider that students had not received training in post-editing before data collection, but they had gone through traditional translation training. Their improved results indicate that post-editing performance (and presumably competence, too) benefits from traditional translation training as well. Obviously, this does not mean that explicit training in post-editing should not be provided, but it demonstrates that teaching from scratch translation to trainees is not a waste of time at the digital age.

Overall, these findings suggest that formal training may implicitly teach students how to produce approximately the same quality text in a shorter time. It is also worth noting that, even if the total number of errors did not show a significant drop, there was an inner redistribution of errors, indicating that human translators learnt how to find equivalents for terms and how to follow the stylistic requirements of the target language, and post-editors learned how to spot fluency mistakes in the MT output and correct them.

The third research question sought to determine the relation between background factors (time, source language competence, and subject competence) and translation/post-editing performance. In this study, time proved to be a key background factor, which showed a significant relationship with accuracy in the human translation condition and with terminology in the post-editing condition. More specifically, students' temporal efforts are related to accuracy and terminology

improvements. In other words, more accurate human translation and terminologically more correct post-edited texts require more time.

In addition, in the post-editor group, thematic background knowledge and grammar competence emerged as crucial background factors. Both of them were significantly related to overall quality, and thematic background knowledge also showed significant correlations with fluency and style.

These findings may seem self-evident; however, they are in contrast with previous results on background factors affecting legal translation (Lesznyák et al. 2022). When comparing and explaining findings from this study with the mentioned previous findings on legal translation, the differences between the source texts must be emphasized. The bilingualism abstract was a text whose content and form had long been familiar to students. On the other hand, a copyright contract, which was the source language text in the legal translation / PE task, was something that students had just got acquainted with shortly before data collection took place. It should also be highlighted that both thematic background tests (the bilingualism and the copyright law tests) focused on the narrow field the relevant source texts covered.

In the legal text condition, time showed no correlation with performance. The conclusion is that spending more time on the translation/post-editing task is only a crucial factor in performance if the translator works within their own domain. Another difference between the findings of the two studies is that in the legal translation study, there was no significant correlation between subject/thematic knowledge and translation/post-editing performance. Nevertheless, language competence, particularly reading, played a major role in legal translation performance. A possible explanation for the different findings is that whenever translators work with a text that falls within the area of their expertise, subject competence counts. However, when they work in a field that is largely unknown for them, it seems to be irrelevant how much they know about the narrow topic of the text itself. In these situations, it is reading competence that helps translators compensate for their lack of wider, general background knowledge.

These findings underline the complexity of translation and post-editing performance, suggesting that the interplay of several external and internal factors may create numerous different setups, in each of which different sub-competencies of the translator may prove to be vital in performance.

Conclusions

The purpose of the current study was to reveal differences between the efficiency of post-editing and translation in a student sample when translating a text with a relatively familiar content. The role of background factors was also studied.

We found that post-editing brings no time gains, but it results in better quality target texts. In addition, second-year students, both translators and post-editors, work faster than first-year students, however, the overall quality of their target text does not improve. Nevertheless, they show improvement on some aspects of translation quality, suggesting that there is an inner restructuring of error types, with some errors decreasing in number, while others slightly (but not significantly) growing. As for background factors, time and subject/thematic knowledge emerged as crucial factors related primarily to post-editing performance, but to some extent, to translation performance, as well. Some of our results are in sharp contrast with our previous findings on legal translation; a detailed description was given on the possible reasons of this in the Discussion section.

The empirical findings in this study provide a new understanding of how translation students can profit from post-editing and of how background factors may influence their performance. It also appears to be the first study to investigate background factors in post-editing in an empirical manner.

There are several limitations to this study: the sample is relatively small, particularly when it is further divided into groups for comparisons. Additionally, participants are from one particular university in Hungary, which may limit the generalizability of the findings, although it is generally true that most empirical studies in translation research are carried out in just one institution. Another shortcoming of the study is that a major background factor, namely target language competence, was not tested due to a lack of appropriate instruments.

The limitations of the study give hints on what further research should focus on. On one hand, the large amount of data collected within the large-scale research project should be further analyzed, thus data from more participants could give a more refined picture on students' translation and post-editing performance and competence. Testing Hungarian (that is, the target) language skills would be vital, too. In addition, including professionals in the study would be very important to see differences between trainees and professionals. We have started working on these tasks and hope to have further results soon.

On the other hand, a systematic, empirical comparison of training methods and strategies is needed to discover how training institutions could best foster trainees' post-editing competence. In other words, different training programs in different institutions, preferably in different countries should be compared to move beyond simply suggesting (otherwise valuable) activities.

Lesznyák, Márta; Sermann, Eszter; Bakti, Mária. 2023. Translation and post-editing performance of translation students – a cross-sectional analysis. In: *L10N Journal* 2(2), pp. 7–23.

Bibliography

- Aranberri, Nora, Labaka, Gorra, de Ilarraza, Arantza, Sarasola, Kepa. 2014. Comparison of post-editing productivity between professional translators and lay users. In: O'Brien, Sharon, Simard, Michel, Specia, Lucia (eds.). 2014. *Proceedings of the Third Workshop on Post-Editing Technology and Practice*. Association for Machine Translation in the Americas. pp. 20–33.
- Bangalore, Srinivas, Behrens, Bergljot, Carl, Michael, Ghankot, Maheshwar, Heilmann, Arndt, Nitzke, Jean, Schaeffer, Moritz, Sturm, Annagret. 2015. The role of syntactic variation in translation and post-editing. In: *Translation Spaces 4*: pp. 119–144. DOI:10.1075/ts.4.1.06sch
- Carl, Michael, Schaeffer, Moritz. 2017. Why Translation Is Difficult: A Corpus-based Study of Non-Literality in Post-editing and From-Scratch Translation. In: *Hermes* 56: pp. 43–57. DOI:10.7146/hjlc.v0i56.97201
- Carl, Michael, Dragsted, Barbara, Elming, Jakob, Hardt, Daniel, Jakobsen, Arnt Lykke. 2011. The Process of Post-Editing: A pilot study. In: Sharp, Bernadette, Zock, Michael, Carl, Michael, Jakobsen, Arnt Lykke (eds.). 2011. *Proceedings of the 8th International NLPCS Workshop*. Special Theme: Human-Machine Interaction in Translation. Frederiksberg: Samfundslitteratur. pp. 131–142.
- Carl, Michael, Gutermuth, Silke, Hansen-Schirra, Silvia. 2015. Post-editing Machine Translation: Efficiency, Strategies and Revision Processes in Professional Translation Settings. In: Ferreira, Aline, Schwieter, John (eds.). 2015. *Psycholinguistic and Cognitive Inquiries into Translation and Interpreting*. Amsterdam/Philadelphia: John Benjamins. pp. 145–174.
- Collombat, Isabelle. 2006. General knowledge: A basic translation problem solving Tool. In: *Translation Studies in the new Millennium*, 4. <https://univ-sorbonne-nouvelle.hal.science/hal-01452326>
- Čulo, Oliver, Nitzke, Jean. 2016. Patterns of Terminological Variation in Post-editing and of Cognate Use in Machine Translation in Contrast to Human Translation. In: *Proceedings of the 19th Annual Conference of the European Association for Machine Translation*. pp. 106–114.
- Daems, Joke, Vandepitte, Sonia, Hartsuiker, Robert, Macken, Lieve. 2017. Translation Methods and Experience: A Comparative Analysis of Human Translation and Post-editing with Students and Professional Translators. In: *Meta: Journal des traducteurs/Meta: Translators' Journal* 62(2): pp. 245–270. DOI:10.7202/1041023ar
- Do Carmo, Felix, Moorkens, Joss. 2020. Differentiating Editing, Post-Editing and Revision. In: Koponen, Maarit, Mossop, Brian, Rober, Isabelle, Scocchera, Giovanna (eds.). *Translation Revision and Post-Editing*. London and New York: Routledge. pp. 35–49.
- Domingo, Miguel, García-Martínez, Mercedes, Peris, Álvaro, Helle, Alexandre, Estela, Amando Bié, Laurent, Casacuberta, Francisco and Herranz, Manuel. 2020. A user study of the incremental learning in NMT. In: *Proceedings of the 22nd Annual Conference of the European Association for Machine Translation*, pp. 319-328. *European Master's in Translation (EMT)*. 2022. *Competence Framework*. https://commission.europa.eu/resources-partners/european-masters-translation-emt/european-masters-translation-emt-explained_en.
- EMT expert group. 2022. *European Master's in Translation. Competence Framework 2022*. [emt_competence_fwk_2022_en.pdf](#) (5 September 2023)
- Fiederer, Rebecca, O'Brien, Sharon. 2009. Quality and machine translation: A realistic objective. In: *The Journal of Specialised Translation* 11(1): pp. 52–74.
- García, Ignacio. 2010. Is Machine Translation Ready yet? In: *Target* 22 (1): pp. 7–21. DOI:10.1075/target.22.1.02gar
- Guerberof Arenas, Ana, Moorkens, Joss. 2019. Machine translation and post-editing training as part of a master's programme. In: *Jostrans: The Journal of Specialised Translation*. 31: pp. 217–238.
- Hurtado Albir, Amparo. (ed.) 2017. *Researching Translation Competence by PACTE Group*. Amsterdam/Philadelphia: John Benjamins.

- Lesznyák, Márta; Sermann, Eszter; Bakti, Mária. 2023. Translation and post-editing performance of translation students – a cross-sectional analysis. In: *L10N Journal* 2(2), pp. 7–23.
- Jia, Yanfang, Carl, Michael, Wang, Xiangling. 2019. How Does the Post-editing of Neural Machine Translation Compare with From-Scratch Translation? A Product and Process Study. In: *The Journal of Specialised Translation* 31: pp. 60–86.
- Kim, Haeyoung. 2006. The Influence of Background Information in Translation: Quantity vs. Quality or Both? In: *Meta* 51(2): pp. 328–342.
- Krajcso, Zita. 2018. Translators' Competence Profiles vs. Market Demand. In: *Babel* 64 (5-6): pp. 692–709. DOI:10.1075/babel.00059.kra
- Krings, Hans P. 2001. *Repairing Texts: Empirical Investigations of Machine Translation Post-editing Processes* (Geoffrey S. Koby, ed.). Ohio&London: The Kent State University Press.
- Lesznyák, Márta, Bakti, Mária, Sermann, Eszter. 2022. The role of source language competence and subject knowledge in legal translation. Paper presented at the Translation and Interpreting Forum, Olomouc (TIFO 2022) Conference, Olomouc, Czech Republic. (2022, November 11–12).
- Martindale, Marianna, Carpuat, Marine. 2018. Fluency Over Adequacy: A Pilot Study in Measuring User Trust in Imperfect MT. In: *Proceedings of the 13th Conference of the Association for Machine Translation in the Americas (Volume 1: Research Track)*. Boston, MA. Association for Machine Translation in the Americas. pp. 13–25.
- Neubert, Albrecht. 2000. Competence in Language, in Languages, and in Translation. In: Schäffner, Cristina, Adab, Beverly (eds.). *Developing Translation Competence*. Amsterdam: John Benjamins. pp. 3–18. DOI:10.1075/btl.38.03neu
- Nitzke, Jean, Hansen-Schirra, Silvia. 2021. *A Short Guide to Post-editing*. Berlin: Language Science Press. DOI:10.2581/zenodo564689
- Nitzke, Jean, Hansen-Schirra, Silvia, Canfora, Carmen. 2019. Risk Management and Post-editing Competence. In: *The Journal of Specialized Translation*. 31: pp. 239–259.
- PACTE. 2003. Building a Translation Competence Model. In: Alves, Fabio (ed.). 2003. *Triangulating Translation: Perspectives in Process Oriented Research*. Amsterdam: John Benjamins. pp. 43–66.
- PACTE. 2008. First Results of a Translation Competence Experiment: 'Knowledge of Translation' and 'Efficacy of Translation Process'. In: Kearns, John (ed.). 2008. *Translator and Interpreter Training: Issues, Methods and Debates*. London: Continuum. pp. 104–126.
- PACTE Research Group. 2014. First Results of PACTE Group's Experimental Research on Translation Competence Acquisition: the Acquisition of Declarative Knowledge of Translation. In: *MonTI. Monografías de Traducción e Interpretación*. pp. 85–115.
- PACTE Group. 2017a. PACTE Translation Competence Model: A holistic, dynamic model of translation competence. In: Hurtado Albir, Amparo. (ed.) 2017. *Researching Translation Competence by PACTE Group*. Amsterdam/Philadelphia: John Benjamins. pp. 35-41.
- PACTE Group 2017b. The second stage of PACTE group's research. Experimental research into the Acquisition of Translation Competence. In: Hurtado Albir, Amparo (ed.). *Researching Translation Competence by PACTE Group*. Amsterdam/Philadelphia: John Benjamins. pp. 303-308.
- Plitt, Mirko, Masselot, Francois. 2010. A Productivity Test of Statistical Machine Translation Post-Editing in a Typical Localisation Context. In: *The Prague Bulletin of Mathematical Linguistics* 93: pp. 7–16.
- Pym, Anthony.1992. Translation Error Analysis and the Interface with Language Teaching. In: Dollerup, Cay, Loddegaard, Anne (eds.). *The Teaching of Translation*. Amsterdam: John Benjamins. pp. 279–288. DOI:10.1075/z.56.42pym
- Pym, Anthony. 2003. Redefining Translation Competence in an Electronic Age In Defence of a Minimalist Approach. In: *Meta* 48(4): pp. 481–497.
- Screen, Ben. 2016. What Does Translation Memory Do to Translation? The Effect of Translation Memory Output on Specific Aspects of the Translation Process. In: *Translation and Interpreting* 8(1): pp. 1–18. DOI:10.12807/ti.108201.2016.a01

- Lesznyák, Márta; Sermann, Eszter; Bakti, Mária. 2023. Translation and post-editing performance of translation students – a cross-sectional analysis. In: L10N Journal 2(2), pp. 7–23.
- Toral, Antonio. 2019. Post-editeese: An Exacerbated Translationese. In: Proceedings of Machine Translation Summit XVII: Research Track. Dublin: European Association for Machine Translation. pp. 273–281.
- Ureel, Jim, Diels, Ella, Robert, Isabelle, Schrijver, Iris. 2021. The Development of L2 Sociolinguistic Competence in Translation Trainees: An Accommodation-based Longitudinal Study into the Acquisition of Sensitivity to Grammatical (In)formality in English. In: The Interpreter and Translator Trainer 16(1): pp. 78–95. DOI:10.1080/1750399X.2021.1900712
- Yamada, Masaru. 2019. The impact of Google Neural Machine Translation on Post-editing by student translators. In: The Journal of Specialised Translation. 31: pp. 87–106.

Portuguese translators' attitude to MT and its impact on their profession

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Abstract

Advances in Neural Machine Translation in recent years have brought these systems closer to delivering on the promise of universal, instant translatability. Magnified by the release of successive iterations of generative AI systems, recent news heralds both a new era for translation and the obsolescence of the translator. Drawing on data from recent language industry surveys produced by national and international organizations, as well as a specific survey on the Portuguese market with a longitudinal dimension, this paper seeks to determine the impact of technology, particularly MT, on the perceptions of translators and their career choices. The findings indicate that MT is widely used in the industry, but only a third of MT users rate their experience as positive. MT projects most frequently involve human participation as post-editors. MT is seen as having improved despite several shortcomings. However, greater incorporation of technology is seen as considerably reducing satisfaction and potentially triggering significant attrition. Knowledge of MT and first-hand experience are seen as positively influencing attitudes towards MT.

Keywords: translation technology; machine translation; working conditions; translator training; attrition

Introduction

Although largely invisible in their work, translators have historically been the agents of translation. Most of society may still think that this is the case, but Machine Translation now accounts for the vast majority of all translational action. Using data published by Google and an estimate of full-time professional translators and interpreters in the world, Pym and Torres-Simón highlighted that human mediators are producing “a mere 0.68% of what Google Translate is reported as processing” (2021, 3). The authors stress that much of this translated volume would never have been commissioned to a professional translator, as its content is not meant to be published or read. Still, this represents a remarkable shift, and advances in Neural Machine Translation (NMT) have made this technology increasingly reliable for many uses. In fact, Post-Editing Machine

Translation (PEMT) is now a generalized service offered by Language Service Providers (LSP) of all sizes.

Translation can thus be seen as a profession under pressure of technology, and recent advances in Large Language Models (LLM) that underlie Machine Translation (MT) and generative Artificial Intelligence (AI) chatbots are bound to accelerate change in the industry.

The impact of technology on translation and how it may shape its future has received significant scholarly attention, within the field of Translation Studies but also across the spectrum of Natural Language Processing research. However, comparatively little attention has been devoted to the perceptions of translators toward MT, either as a tool of trade or as an industry-changing phenomenon. In one of the early studies into this topic, Guerberof Arenas concluded that “[we] do not find a negative attitude towards working with MT (although the majority of translators might dislike it) but rather problems with how the task is paid or organized” (2013, 93). Cadwell, O’Brien, and Teixeira conducted research on the human factors that determine MT (non-) adoption, and their findings “suggest that translators sometimes find MT useful and that they can have positive experiences of it. It has been relatively rare to record positive statements from translators about MT. Though this does not qualify as decentring the human agent, it at least makes a step towards giving space to the material agent—in this case MT” (2018, 318). Nunes Vieira (2020) also addressed the topic using an analysis of translators’ discourse in blogs and forum postings regarding the incidence and nature of topics like machine translation, among others. Based on data spanning from 2010 to 2017, he concluded that MT was a secondary issue for translators (outranked, e.g., by pay) and that “most criticism of MT concerned primarily not a fear of being outperformed by MT systems or an intrinsic aversion to the technology, but rather MT’s current limitations and some of the business practices that surround its use” (Nunes Vieira 2020, 16). More recently, Pym and Torres-Simón (2021) assessed the effects of automation in the translation profession and concluded that there are strong signs of change in wage dispersion, and uneven growth in the industry, where large players have enjoyed massive growth rates and small players (including freelancers) actually saw their revenue drop. The authors also determined that company size is positively correlated with investment in technology and automation (of translation and other tasks).

Industry associations have published position papers on MT and its impact on translation and translators. FIT, e.g., has published position papers on the Future of Professional Translators (2017), Machine Translation (2019), and Post-Editing (2021), acknowledging that translation as a professional activity is changing and becoming increasingly influenced by technology. Little is actually said about working conditions or perceptions of translators, other than this transformation will require adaptation and that risks exist, like rate degradation (FIT 2017) and professional dissatisfaction

due to non-adaptive technologies (FIT 2021). AVTE (2021) also published a manifesto on MT in audiovisual translation (AVT) in response not only to the hype surrounding MT but also to reports on MT being adopted extensively by major international AVT agencies. The manifesto drew attention to aspects that affect MT output and that are specific to AVT, like sound and image, and to the lack of customized MT solutions. Ultimately, the manifesto argued, “[u]nscrupulous use of MT will increasingly lead to brain drain and talent crunch” (AVTE 2021, 2). This, in turn, would undermine the long-term sustainability of the industry. Although the manifesto draws on a number of sources for its assertions, it contains very limited empirical support for the suggested “talent crunch”.

Industry and professional associations also produce surveys on topics of interest for their members. Here is where the most relevant information on the perceptions of translators about their working conditions, including MT, can be picked up. However, systematic data collection on this topic can only be found in European Language Industry Survey (ELIS) reports.

In the 2023 edition of the ELIS survey, MT and AI were identified as top trends in the industry. However, the report also mentioned that “reported machine translation use remains well below popular estimations” (ELIA 2023b, 37). It noted a continued trend toward post-editing and automation across the industry, but among freelance translators the MT-related stress factor did not increase relative to 2022. In fact, while it was identified as a relevant stress factor, it was largely surpassed by the financial stress factors such as pay/rates and economic climate. According to the report results presentation deck, “[t]his seems to indicate that the freelance community is finding ways to cope with the technology although quite a few respondents are still struggling with it” (ELIA 2023a, 33). Surveys carried out by translator associations like AVTE or ITI only sporadically address the effects of automation, but the latest editions of the surveys from these two associations (2022/2023) make no mention of MT. No Portuguese association produces any such report.

This study therefore aims to address this informational gap, focusing on individual translators working with European Portuguese in Portugal. After an initial survey carried out in 2017 to determine whether MT instilled fear in translation professionals regarding their future, namely their livelihood and societal relevance, a second similar survey was carried out in 2023, adding a longitudinal dimension. The aim is to determine whether translators see technology as a threat or as an enhancement of their abilities and creativity; to acquire data on adaptation to a more technologically mediated profession; to assess job satisfaction and the potential impact of technology; and how these aspects have evolved over the period of 6 years that mediates both surveys.

1 Methodology

The main tool for this study was an online survey directed at translators with European Portuguese as a working language, with a special interest in professional translators domiciled in Portugal. The language of the survey and its delivery methods are aimed at narrowing respondents to the above target audience.

1.1 Survey population, sample, and coverage error

The field of professional translators in Portugal is made up of approximately 3,300 individuals, according to data from the national statistics office, Statistics Portugal. This number has not changed significantly between the two surveys. Considering the delivery method is based mostly on social media, a sample cannot be accurately determined other than by the number of members in the Facebook group called “Tradutores com Vida”. Translator associations were contacted for publicity, but they also mostly used their social media presence to reach out to their members.

Coverage error is expected to be very high because inclusion in the sample is highly dependent on Facebook's algorithms, and no direct contact is established with the survey population. As mentioned above, translator associations were contacted for publicity in order to mitigate this effect.

1.2 Language and tools

Since the primary intended survey population is professional translators domiciled in Portugal, the questionnaire is set up in Portuguese.

For the 2017 survey, the online tool EncuestaFacil was used to collect data. Data analysis was conducted using the analytics features of EncuestaFacil and Excel. For the 2023 survey, the online tool Qualtrics was used to collect data. Data analysis was done using the analytics features of Qualtrics and Excel. The tool change is related to a change in affiliation by the researcher, but there is no significant difference in functionality between the two. Both comply with GDPR standards.

1.3 Structure

The questionnaire is divided into four main sections. All questions were mandatory unless otherwise indicated. Section I presented the aims of the questionnaire and collected the informed consent from participants. Section II collected demographic data for sample characterization, including age, country, education, and translators' association affiliation. Section III collected professional data, including years of experience as a translator, whether translation is a part-time or full-time activity, the percentage of income earned from translation, and areas of expertise. Section IV

collected data on electronic tools and satisfaction, including which tools are used, personal satisfaction with compensation, social recognition, fulfillment and working conditions (5-point Likert), previous participation in projects explicitly involving MT and role in such projects, and satisfaction working in MT projects in different roles (5-point Likert). Participants were also asked to rate the evolution of MT systems in terms of accuracy, terminology used, style, and language variants (4-point Likert), and they were also given the opportunity to list the major hurdles facing MT systems (optional text field). The final three questions in this section dealt with the effect of greater incorporation of technology and satisfaction in the future (in terms of compensation, social recognition, fulfillment, and working conditions) (5-point Likert), whether such technological evolution might lead to a decision to switch to a different professional activity (Y/N), and a training needs assessment (optional).

No personally identifiable information was collected in mandatory fields. Participants were given the opportunity to share their email addresses for participation in a future qualitative stage of the study.

1.4 Delivery and rollout

In 2017, the main delivery mode was via a Facebook group called “Tradutores com Vida” (≈ 2750 members) and snowballing. In 2023, the same Facebook group was used (now at ≈ 3200 members), and three professional associations were contacted to distribute the questionnaire to their members: APT, APTrad, and ATAV. Snowballing and postings on LinkedIn were also used.

The delivery of the questionnaire in 2017 started on July 13 and ended on July 31. In 2023, the questionnaire was first delivered on September 13 and closed on October 15.

1.5 Response rates

In 2017, a total of 95 questionnaires were fully answered (out of 127 that were started). The figures in 2023 were very similar, totaling 92 fully answered questionnaires (out of 123 that were started). Considering an approximate sample size of ≈ 3200 units, the response rate in 2023 was 2.875%, slightly below the 2017 rate of 3.45%. This lower response rate was somewhat expected due to lower activity in the group.

For the analysis, only fully answered questionnaires are considered.

2 Results and discussion

The average age of respondents rose from 42.84 years in 2017 to 44.48 years in 2023. The mechanisms devised to target translators in Portugal have remained effective, capturing 91% of respondents located in Portugal (vs 89% in 2017).

Table 1 – *Education*

	2017	2023
Primary education	0%	0%
Secondary education	5%	0%
Higher education (Translation)	60%	65%
Higher education (other areas)	35%	35%

Table 1 shows the highest educational level attained by respondents. There are no significant changes from 2017 to 2023. Translators remain a highly qualified professional group. There is a significant number of translators with degrees in other areas, but holders of degrees in translation are on the rise. This trend is compatible with the creation of several BA programs in translation in the mid-2000s in response to the Bologna process, and more people being able to pursue a first- or second-cycle degree in translation. Prior to that, tertiary education specifically in translation was very limited. Considering the 83% of respondents with a degree in translation or interpreting in the ELIS report, this trend is expected to continue.

A significant shift was observed in professional translator association affiliation. In 2017, 69% of respondents reported not being members of any professional translator association. In 2023, only 36% of respondents reported not being members of any professional translator association. APTRAD is the largest Portuguese translator association, and its members had the largest representation in the survey, closely followed by ATAV, a specialized Portuguese translator association for AVT professionals. ATAV did not exist in 2017. It should be noted that respondents could select more than one option in this question, as it is not uncommon for professionals to belong to more than one association depending on their specialisms or countries where they offer their services.

The average professional experience of respondents rose slightly from 16.5 years in 2017 to 17.5 years in 2023. A trend toward specialization is also visible in Table 2, particularly in the rise of translators reporting full-time dedication to translation.

Table 2 – *Part-time/Full-time*

	2017	2023
Full-time	66%	86%
Part-time	31%	13%
Student	3%	1%

This is further corroborated by the weight of translation in the income of respondents: 80% reported earning 76-100% of their income from translation in the 2023 survey (vs 60% in 2017).

These figures are well above the average found in the ELIS survey, where only 66% reported earning enough as a freelancer.

As far as areas of specialization are concerned, a new category of Literary Translation was added since the 2017 survey. In 2023, 28% of respondents reported having Literary Translation as one of their specializations. General Translation remains at the top of areas of specialization (2023: 58% vs 2017: 66%), followed by Technical Translation (2023: 53% vs 2017: 61%) and Audiovisual Translation (2023: 42% vs 2017: 25%). Software Localization (2023: 11% vs 2017: 19%) and Transcreation (2023: 10% vs 2017: 7%) come at the bottom. The significant rise in AVT-specialized translators is potentially due to the fact that they now have their own association, which is known to be very active and it has seemingly very engaged members.

Table 3 – *Electronic tools*

	2017	2023
Electronic resources on disk or online	93%	96%
Word processor (Word, Pages, etc.)	90%	91%
Language checking tools	76%	74%
Subtitling software	26%	46%
CAT/TM tools (Trados, MemoQ, etc.)	71%	67%
Software localization tools	22%	5%
MT tools (Google Translate or APIs for Trados, MemoQ, etc.)	29%	53%
Other	3%	1%

There are no significant changes in the tools used by the participants, except for the significant pick-up in MT use, either as stand-alone or as part of a CAT tool. The variation in subtitling software may, again, be related to the support of this survey by the Portuguese AVT translator association.

When asked how satisfied they were with their professional situation as translators, participants reported feeling more satisfied with their Professional Fulfillment (avg. 3.76) and Working Conditions (avg. 3.76), and less so with their Income (avg. 2.77) and

Social Recognition (avg. 2.48). These results from 2023 do not display a significant variation from the data collected in 2017 for the same data points.

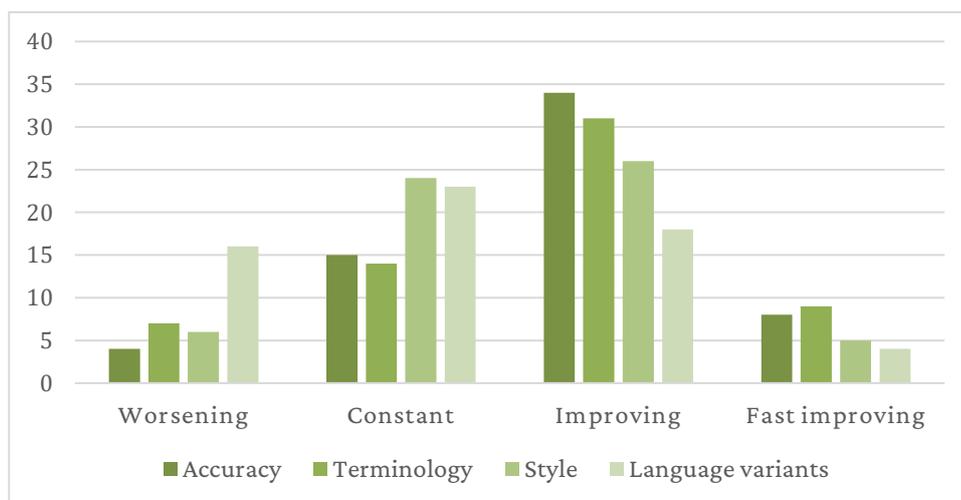
A significant variation can be observed in the participation in projects explicitly involving MT (i.e., the use of MT is known from the start). In 2017, 46% of respondents had never participated in projects involving MT, whereas in 2023 that figure dropped to 34%. In 2017, 26% of respondents rated their experience with MT in said projects as positive and 22% as negative. In 2023, 34% rated the experience as generally positive and 33% as generally negative. Although the use of of MT is becoming more widespread, dissatisfaction levels have risen disproportionately to satisfaction levels.

In projects involving MT, the most frequent role reported by the respondents is post-editor, followed by reviewer and translator. Professional satisfaction in such projects is lowest for reviewers (avg. 2.28) and post-editors (avg. 2.31), and somewhat higher for the role of translator (avg. 2.54). A correlation is noticeable between the ability to control the use of MT and satisfaction.

The main problems of MT systems working into European Portuguese, according to the respondents, are lack of awareness to context, terminology inconsistencies, inability to properly separate Brazilian Portuguese and European Portuguese, literal translations, and grammatical concordance issues. The inputs were obtained in an optional text field.

However, despite the low satisfaction levels reported with MT projects, respondents generally rated positively the evolution of MT over the last few years. Figure 1 shows that quality is perceived to be mostly improving or constant. Accuracy and terminology are the categories with the most significant perceived improvements, whereas style and proper handling of language variants fall behind.

Figure 1 - *Evolution of MT*



Asked how a greater incorporation of technology in translation (i.e., post-editing and reviewing becoming the norm) would impact their satisfaction, respondents indicated

that this would have a very significant impact, especially on their professional fulfillment and income.

Figure 2 - *Job satisfaction: current vs more MT*

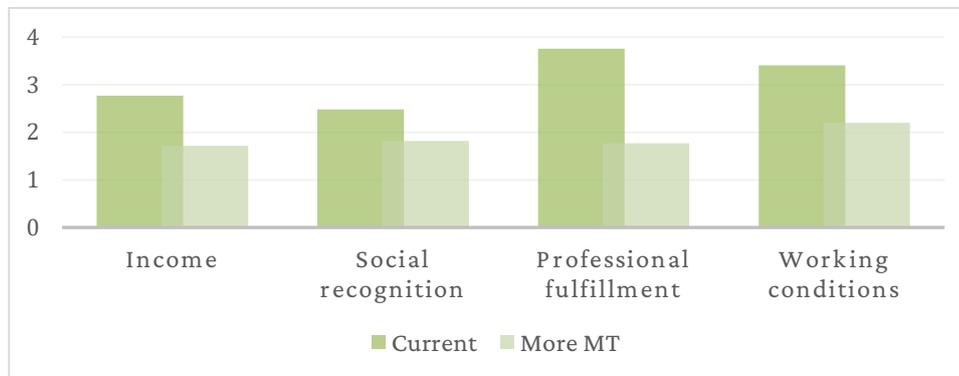
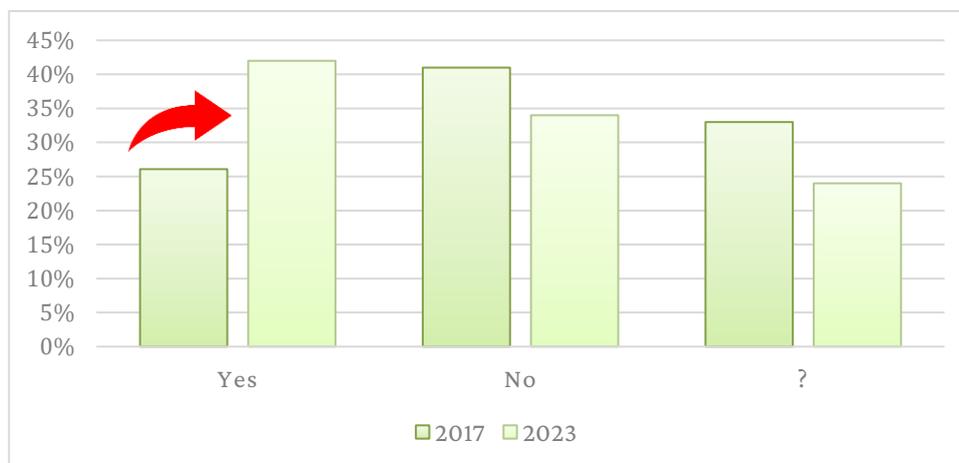


Figure 2 shows the magnitude of change in satisfaction across four different items. The proportions are similar to those recorded in 2017, except for Income. More experience with projects involving MT has turned respondents more pessimistic toward the impact of MT on their income from translation.

Figure 3 - *Willingness to change profession*



Consequently, survey participants were asked whether such a technological change (increased use of MT) might make them abandon the trade of translation. Figure 3 compares the results from the most recent survey to the results obtained 6 years ago. It is noticeable a significant leap in the number of people willing to change trades due to MT and greater technology integration.

For a better understanding of the factors influencing translator satisfaction and perceptions of the increased use of MT, further analysis was carried out. Demographic variables were used to ascertain potential correlations and provide a wider context.

The age groups showing more tolerance to the increased use of MT are those under 30 and over 61, whereas respondents aged 31 to 40 are those exhibiting greater willingness

to exit the market in such a scenario (69,2%). It should be noted that this is also the age group (31-40) with the greatest representation of AVT professionals, suggesting a stronger negative correlation between increased use of MT and satisfaction in this segment.

Education and continuous professional development (CPD) were also identified as relevant variables. As seen in Table 1, all survey participants hold a university degree. Holders of degrees in Translation are significantly less likely to abandon their current profession than those holding degrees in other areas. Survey participants who reported having had training in MT show significantly less risk of attrition in case of increased use of MT (< 30%) than survey participants who reject MT and MT-related training outright (72.2%). Willingness to change trades is significantly lower in participants who have taken part in projects explicitly involving MT and rated this as a positive experience (29%), somewhat higher among survey participants who never took part in such projects (35.5%), and significantly higher in participants who rated their participation in projects with MT as negative (64.5%). It is thus clear that knowledge of MT acquired through higher education, CPD, and professional experience positively influences the attitudes and perceptions of translators towards MT.

At the end of the day, however, more than 40% of the survey participants reported willingness to change trades due to diminishing job satisfaction with increased use of MT, and ultimately this might lead to adverse selection in the translation market.

Conclusions

Adverse selection occurs in the context of asymmetric information. Classically, it is a buyer/seller problem as illustrated by the inability of buyers to distinguish between a good and a bad used car, which ultimately can lead to bad decisions (Akerlof 1970). The concept has been applied by Chan to the translation market, arguing that low pay might cause adverse selection in the market, i.e., “good’ translators may leave the translation profession for other professions” (2009, iii). The current survey results also suggest that job satisfaction has the potential to stimulate translation professionals to switch careers to an extent that might cause significant market disruption.

Moreover, the translation sector in Portugal does not appear to be efficient in attracting talent. According to data released by the Directorate-General for Statistics in Education and Science (DGEEC) just over 300 students are admitted every year to BA programs in Translation or Languages with a significant track in Translation. Admitting that approximately 30% will drop out or change to another program, this still means around 200 new graduates every year. If we look at the number of freelancers and companies operating in Portugal published by Statistics Portugal, we notice some fluctuation in the number of freelancers and a healthier growth trend in company creation. Nevertheless, the net balance over 5 years: no more than 400 freelancers and 80

companies (most of them in the 2-10 employee bracket). The industry is seemingly unable to attract and/or absorb the graduates. That said, it should also be noted that official data from the DGEEC indicate very low unemployment among graduates from these programs, and consequently demand for their skills elsewhere. Hao and Pym (2022), in a study of the employment of Masters graduates from Melbourne University, found that only one-third of graduates go on to work as translators or interpreters, a figure that is at par with other international surveys on T&I graduates. The remaining graduates find employment in areas where their multilingual skills are in demand or carry on studying.

Portugal is currently facing a shortage of teachers in the public education system. In response, the Government is changing the rules for the training of teachers, namely by lowering the ECTS required in certain subjects to access teacher-training programs and by improving the working conditions of teachers. These upcoming changes may well make the education system more appealing to highly-trained professionals like translators who feel unhappy with the increasing technologization of translation, and who would enjoy greater financial stability and social recognition.

Financial matters are indeed highlighted as the main area of concern for translators in every single study quoted here, either academic or from the industry. The perceptions related to MT and the attitude toward this tool are not of outright rejection. Some usefulness is seen in MT, but translators are acutely aware of the limitations of MT, especially in their own fields of specialization. It is reminiscent of the introduction of Computer-Assisted Translation (CAT) tools and the still highly popular slogan of never having to translate the same sentence twice (and pay for it), which appealed in different ways to customers of translation and translators. Many translators have adopted CAT tools, and others have resisted them to this day. Nevertheless, CAT tools were developed to address the needs of translators, inviting them into the process, and also of larger LSPs. MT, LLMs and generative AI all but completely exclude translators from their development processes, and their workings are hard to grasp even for their own makers due to the machine-learning abilities and the large amounts of data needed for their training, a significant portion of which is uncontrolled. This should make us wonder whether the MT/AI industry currently sees translators as users of machine translation.

If so, AI should not focus solely on automation efficiency and emulation of human activity, but rather on the “amplification of human abilities and empowerment, while maintaining human control” e.g., using sensors to “amplify human cognitive abilities in translation through shifts in modality, timing, and levels of automation as starting points” (O’Brien 2023, 13). A truly human-centered approach to augmented translation seems key to retaining talent, as it does not immediately instill fear of replacement and may well refashion part of the industry as a technological, detail-oriented craft.

Brogueira, João. 2023. Portuguese translators' attitude to MT and its impact on their profession. In: L10N Journal 2(2), pp. 24–35.

Bibliography

- Akerlof, George A. 1970. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism." *Quarterly Journal of Economics* 84 (3): 488–500. <https://doi.org/10.2307/1879431>.
- AVTE. 2021. "Machine Translation Manifesto." AudioVisual Translators Europe. https://avteurope.eu/wp-content/uploads/2022/10/Machine-Translation-Manifesto_ENG.pdf.
- Cadwell, Patrick, Sharon O'Brien, and Carlos S.C. Teixeira. 2018. "Resistance and Accommodation: Factors for the (Non-) Adoption of Machine Translation among Professional Translators." *Perspectives* 26 (3): 301–21. <https://doi.org/10.1080/0907676X.2017.1337210>.
- Chan, Andy Lung Jan. 2009. "Information Economics, the Translation Profession and Translator Certification." <http://www.tdx.cat/handle/10803/8772>.
- ELIA. 2023a. "ELIS 2023 Results." <https://elis-survey.org/wp-content/uploads/2023/03/ELIS-2023-Results.pdf>.
- . 2023b. "EUROPEAN LANGUAGE INDUSTRY SURVEY 2023." <http://elis-survey.org/wp-content/uploads/2023/03/ELIS-2023-report.pdf>.
- FIT. 2017. "FIT Position Paper on the Future for Professional Translators." Fédération Internationale Des Traducteurs. https://library.fit-ift.org/public/Publications/positionpapers/PDP_201704_Future_Professional_Translators_ENFR.pdf.
- . 2019. "FIT Position Paper on Machine Translation." Fédération Internationale Des Traducteurs. https://library.fit-ift.org/public/Publications/positionpapers/PDP_201908_Machine_Translation_ENFR.pdf.
- . 2021. "FIT Discussion Paper on Post-Editing." Fédération Internationale Des Traducteurs. https://library.fit-ift.org/public/Publications/positionpapers/PDP_202105_Post_Editing_ENFR.pdf.
- Guerberof-Arenas, Ana. 2013. "What Do Professional Translators Think about Post-Editing?" *The Journal of Specialised Translation*, no. 19: 75–95. http://www.jostrans.org/issue19/art_guerberof.pdf.
- Hao, Yu, and Anthony Pym. 2022. "Where Do Translation Students Go? A Study of the Employment and Mobility of Master Graduates." *The Interpreter and Translator Trainer*. <https://doi.org/10.1080/1750399X.2022.2084595>.
- Nunes Vieira, Lucas. 2020. "Automation Anxiety and Translators." *Translation Studies* 13 (1): 1–21. <https://doi.org/10.1080/14781700.2018.1543613>.
- O'Brien, Sharon. 2023. "Human-Centered Augmented Translation: Against Antagonistic Dualisms." *Perspectives: Studies in Translation Theory and Practice*. <https://doi.org/10.1080/0907676X.2023.2247423>.
- Pym, Anthony, and Ester Torres-Simón. 2021. "Is Automation Changing the Translation Profession?" *International Journal of the Sociology of Language*. <https://doi.org/doi:10.1515/ijsl-2020-0015>.

Translation Project Management: Duties, Competences and Training. What is the scenario like in Spain?

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Abstract

With the introduction of new technologies and the rise of globalization, the translation industry has undergone significant transformation since the end of the 20th century. What was originally considered an individual and self-employed activity has evolved to meet the demands of the language services industry over the last two decades, resulting in a virtual working environment. It is within this evolving landscape that the role of the Translation Project Manager (PM) has emerged, offering an interesting alternative to students aspiring to diverge from the more traditional career paths linked to Translation and Interpreting (T&I). Based on an observational study of Spanish university curricula, this study aims to discuss the training that future PMs are receiving in regard to Translation Project Management (TPM), focusing on the training content (or lack thereof). The primary objective is to determine whether university training aligns with the demands of the labor market and whether future PMs are adequately prepared for their professional journey.

Keywords: translation project management, translator training, university programs, competences, digital age

Introduction

Despite the growing popularity of project management in translation-related seminars, conferences, and symposia worldwide – take, for instance, Globalization and Localization Association (GALA) Academy Q3 2023 on Project Management¹, or the European Commission Translating Europe Forum 2023² –, the reality is that it is still unfamiliar territory for many people, particularly for newly graduates in Translation and Interpreting (T&I) studies (Quijano Peña 2022). Until the mid-1990s, the translation industry consisted mainly of independent professionals and small agencies (Tirry 2023). However, in the second decade of the 21st century, globalization has

¹ <https://www.gala-global.org/events/events-calendar/gala-academy-q3-2023-project-management>

² <https://2023tef.b2match.io/components/32449>

brought about significant changes in the industry's workflow. As a result, researchers in the discipline have started to focus on the new professional profiles that have emerged around translators (Plaza-Lara 2018a, 511). This is precisely how the role of the Translation Project Manager (PM) came into existence – a profession that is here to stay. While it is true that this profession has been present in the industry since the 1990s when the first translation agencies were established worldwide (such as TransPerfect in the US in 1992, Keywords Studios in Ireland in 1998, or RWS Group in the UK in 1982), “it has been largely overlooked as an object of scholarly inquiry and critical pedagogical reflection in the field of translation studies” (Dunne and Dunne 2011, 6). As Plaza-Lara (2018a, 514) notes, the literature on project management remains limited even today, and it is only in works published from 2010 onwards that this new professional profile has begun to be addressed in detail. Therefore, over the past 13 years, we have witnessed a proliferation of studies and research papers in Spain focusing on translation project management (TPM). These works undeniably paved the way for new research lines and a growing interest in this emerging career path.

In this context, the initial forays into researching this field in Spain were led by Rico Pérez (2002) and Gili (2005). They emphasized the translator's evolution into a PM and the conceptualization of translation as a part of a management process comprising multiple phases. A few years later, Flores Acuña (2012) authored an article based on an experiment conducted in a translation class, aiming to introduce students to the reality of translation project assignments. Nevertheless, it is only since 2015 that an increase in literature related to TPM has been noted. This includes noteworthy PhD dissertations, such as Matcha Abombo's (2015) study on project management and its implementation in T&I studies, Ferrer Simó's (2016) research on audiovisual TPM in Spain, Arevalillo Doval's (2016) focus on quality control and error revision in TPM, and Fuentes-Pérez's (pending publication) study on the impact of the digital age on the role of PMs. Additionally, special mention should be made of the numerous articles published by Plaza-Lara (2018a, 2018b, 2020a, 2020b, 2020c, 2021), which delve into her research on the competences required for PMs and how new technologies influence this professional role, as well as Quijano Peña's (2022) study on TPM training in the curricula of T&I Degrees in Spain, aligning with the content presented in this work.

Given the significance of this emerging career path, this study aims to determine whether T&I university programs in Spain indeed align with market demands and provide students with the necessary training to become competent PMs. This research is divided into two phases. First, it was important to understand the role of PMs in the Spanish labor market. For this reason, a short survey was conducted among 61 Spanish PMs to gain a better understanding of their duties and responsibilities at work. Having collected this data, the second phase of the study focuses on the training that undergraduate students receive in TPM at Spanish universities. The information extracted from the course syllabi includes the course name, the academic year it is

taught in, and whether it is a compulsory or elective course. Lastly, the conclusions derived from this study will be shared, which will address the initial hypothesis of this research: T&I university programs in Spain need to be reviewed and updated in terms of TPM.

1 Theoretical Background: Contextualization of Translation Project Management

Since it was established as a discipline in the 1970s (Hurtado Albir 1996b), translation has been known for being a solitary endeavor undertaken by freelance translators. In most cases, the translator only needed to receive the assignment from the client and perform the translation work using the resources that were available at that time, which were mainly limited and paper-based:

The traditional view of a translator's work environment has been that of a person who works alone, fenced behind a stack of dictionaries, paper, and all sorts of documentation material. Not that this has ever been completely true, but it is certainly a picture surviving in the minds of some outsiders to the profession. (Rico Pérez 2002, 38)

This reality of work being seen as an individual activity continued until the early 21st century. At this stage in history, the context is significantly shaped by the development of new technologies and globalization. These factors have led to a parallel transformation in the translation industry. In the field of computing, the rapid development of what is known as Computer-Assisted Translation (CAT) tools represented a transitional moment in the translator's workflow:

The translation sector has undeniably undergone a revolution in recent years, largely fueled by the integration of computing into the daily practices of the translator. Indeed, in a relatively short period of time, the translator has transitioned from working with pen and typewriter to handling the most sophisticated word processing software available on the market. (Arevalillo Doval 2004, 89)

As noted by Rico Pérez, "In the 21st century, translation has ceased to be a craft and has become a full-fledged industry" (2021, 8). This statement reminds us that the role of translators has changed due to international commerce, globalization, and technological advancements. Previously seen as individual practitioners, translators are now part of the "virtual translation factory" (Rico Pérez 2021, 15). Thus, as businesses started expanding internationally and the demand for translation increased, the first translation agencies and companies emerged in the 1990s, both in Spain and beyond our borders. These organizations, also referred to as *language service providers* (LSPs), became instrumental in managing translation projects.

However, to contextualize the role of the PM within a translation agency or company, it is first important to clarify the distinction between the two, even though for this work, the terms shall be used interchangeably to refer to the PM's workplace. According to Rico Pérez (2021, 17), the following differentiation can be made worldwide:

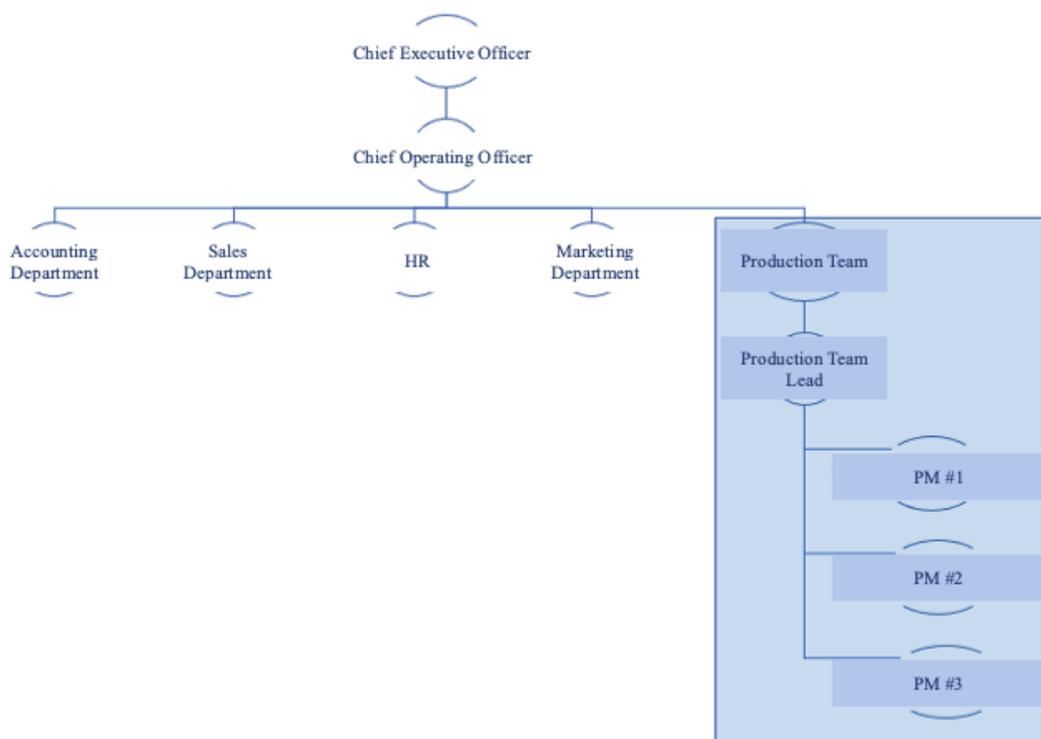
- A *translation agency* acts as an intermediary between the end client and the translator to whom they outsource the work.
- A *translation company* has in-house translators who handle translations for their clients. Occasionally, translation companies outsource work to external (freelance) translators, especially when the workload is substantial or when they do not have in-house translators who handle a specific language pair or specialization.

According to a study conducted by Rico Pérez and García Aragón (2016), between the years 2014 and 2015, there were a total of 418 translation companies in Spain, distributed as follows: 153 in the Community of Madrid, 110 in Catalonia, 34 in the Community of Valencia, and 31 in Andalusia. In 2021, the National Association of Companies of Translation and Interpretation (ANETI 2022) estimated a total of 460 companies in Spain, located in the same regions as indicated in the study by Rico Pérez and García Aragón (2016). It is likewise worth mentioning that, according to the Spanish National Institute of Statistics (INE), there were a total of 1211 translation companies in Spain in 2020. However, it should be noted that out of the total number of companies, over 77% of them (940) had only 1 to 2 employees. In such cases, it is unlikely that one of the two employees would be a PM.

As previously mentioned, it is common in Spain, particularly in small agencies, to not have in-house translators, interpreters, or other T&I professionals such as proofreaders, reviewers, post-editors, or desktop publishers directly employed by the agency. Instead, these language services are outsourced to freelance professionals or even other translation agencies, who may in turn subcontract services to additional freelance professionals. And this is precisely where PMs come into play. To provide a better understanding of the role of the PM within the translation agency, the following figure has been created to depict the general organizational structure. Figure 1 has been modeled after a) a Spanish translation agency located in Madrid, which has 18 employees but does not employ any in-house language professionals; and b) the organizational chart of a translation company presented by Dudi (2018). Although this is not a comprehensive organizational chart, it serves as a visual representation of where the PM stands within the Spanish agency:

Fuentes Pérez, Irene. 2023. Translation Project Management: Duties, Competences and Training. What is the scenario like in Spain? In: L10N Journal 2(2), pp. 36–61.

Figure 1. *Location of the PM within the organizational chart of a small-sized translation agency. Own creation, adapted from Dudi (2018)*



As illustrated in Figure 1, the PM belongs to the Production Department—depending on the company, it is also commonly referred to as the Operations Department or Team—and is usually under the responsibility of the Production Team Lead. Likewise, the number of PMs will depend on the size of the company, the number of clients/accounts, and its turnover. For example, in the case of small-sized companies in Spain (1 to 20 employees), the number of PMs ranges from 2 to 6 in-house PMs. Furthermore, it is essential to highlight that the company's size directly impacts the role of the PM and, specifically, the duties and responsibilities they perform in their daily work.

1.1 Duties and responsibilities

The PM is the person responsible for overseeing and monitoring a project from the moment the client requests a service until it is delivered. They are the ones in charge of the project management process, and among their many responsibilities, their ultimate goal is to ensure client satisfaction upon delivery (Jáñez 2020). When it comes to the duties and responsibilities of PMs, it is essential to refer to the ISO 17100 standard (2015, 9-10) on *Translation Services – Requirements for translation services*, which outlines the tasks that PMs should undertake, which include:

Fuentes Pérez, Irene. 2023. Translation Project Management: Duties, Competences and Training. What is the scenario like in Spain? In: LION Journal 2(2), pp. 36–61.

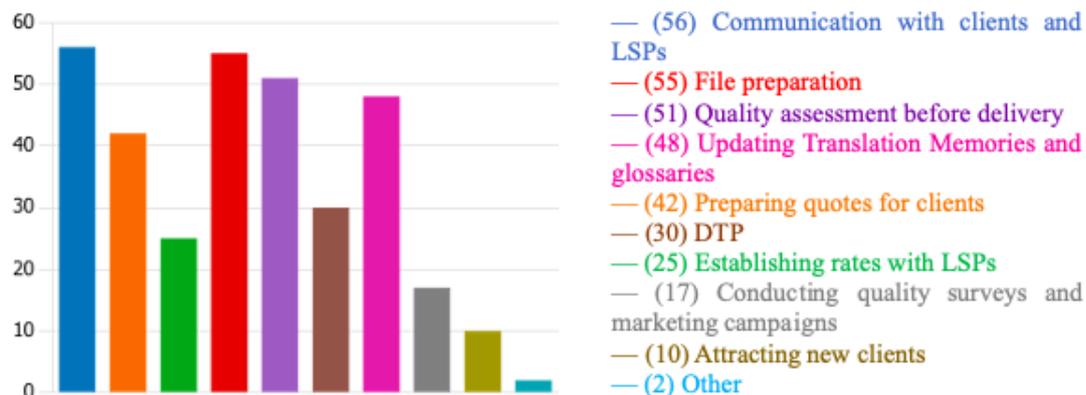
- a) identifying the key requirements and translation project specifications during the pre-production process and following the procedures and specifications throughout its production;
- b) supervising and monitoring the translation project preparation process;
- c) assigning a competent translator or translators to the translation project;
- d) assigning a competent reviser or revisers;
- e) disseminating information, issuing instructions related to the assignment, and managing the translation project to all parties involved;
- f) monitoring to ensure compliance with agreed upon schedule and deadlines;
- g) communicating any changes of the project specifications, if applicable;
- h) monitoring constant conformity to the client-TSP [Translation Service Provider] agreement, project specifications, and, where necessary, communicating with all parties involved in the project, including the client;
- i) ensuring translation and other queries are answered;
- j) managing and handling of feedback;
- k) verifying that the translation service specifications have been compiled with before approving the target language content and giving clearance for its delivery to the client;
- l) delivering of the service.

Project management may also include the following:

- a) if applicable, assigning a competent reviewer or reviewers to the translation project;
- b) if necessary, implementing corrections and/or corrective action;
- c) monitoring to ensure the project does not exceed the agreed budget;
- d) preparing and issuing the invoice;
- e) completing other activities or tasks agreed with the client.

As mentioned above, this study focuses on TPM in Spain. For this reason, it was deemed appropriate to target the survey towards PMs in Spain to ensure that the results obtained accurately reflected the reality of the Spanish labor market in this sector. The survey was designed in early 2023 and was validated by three Spanish PMs. Although originally written in Spanish, Appendix I includes the question represented in Chart 1 translated into English as drafted in the survey. Once validated, it was mainly distributed and shared through LinkedIn, as well as via email to associations like GALA. From June to August 2023, a total of 61 PMs in Spain were surveyed about their duties and responsibilities. Their answers can be found in the following chart:

Chart 1. *Duties and responsibilities of PMs according to 61 surveyed PMs in Spain*



— *Communication with clients and LSPs*. Communication is key for PMs. When it comes to hiring a new PM, communication is the most requested soft skill by translation agencies worldwide (Fuentes-Pérez 2023). PMs should maintain regular communication with linguists, clients, and their teams, either through email or phone calls.

— *File preparation*. In most cases, when a client sends documents for translation, the PM needs to adapt the document to the CAT tool they use. For instance, certain Excel files may require customization before translating the document. This can include actions such as hiding unnecessary columns that do not need to be translated.

— *Quality assessment (QA)*. Before sending the final document to the client, PMs usually carry out a QA to make sure the quality of the translated document is excellent. Although this process may vary from one agency to another, this is the final step that needs to be done before final delivery.

— *Updating Translation Memories (TMs) and glossaries*. Most of the time, the client has specific requirements when it comes to certain terms or ways of translating. Therefore, it is not surprising that clients send their feedback to the PM, and the PM updates the glossary or the TM, ensuring that the term is always translated according to the client's preferences.

— *Preparing quotes for clients*. Some companies, especially small ones, may not have a dedicated Quotes Department or Team. In these cases, it is usually the responsibility of the PM to prepare the quote for the client. The PM takes into account various factors such as language pair, specialization, deadline, and service, among others.

— *Desktop publishing (DTP)*. Sometimes, clients may have specific stylistic or layout preferences for the final document. For example, the translated document must have the same format or length as the original text. In these situations, the PM is responsible for the overall layout of the final document.

— *Establishing rates with LSPs*. This responsibility falls on the Vendor Manager (VM), but it will depend on the company's size and whether the company has a VM. Therefore, in many cases, it is the PM who is responsible for determining the rates with LSPs, whether they are freelance linguists or other translation agencies.

— *Conducting quality surveys and marketing campaigns*. While the responsibility of making calls during marketing campaigns and collecting feedback from clients usually falls on the Sales Department, in many companies, it is also the PM who takes on this task. This includes reaching out to potential clients and gathering feedback on the services provided to existing clients.

— *Other*. 2 out of the 61 surveyed PMs wished to emphasize that there are many more micro duties and responsibilities in their daily work. Some of these micro duties are:

- Monitoring and managing the inbox for the assigned account(s).
- Setting up the project in the translation agency's computerized Translation Management System (TMS).
- Continued use of CAT tools throughout the process.
- Time management.
- Training of new PMS.
- Solving technical and technological issues.

1.2 Competences

Just like translators, PMs also need to acquire a set of competences, either through university education or their professional career, which will enable them to practice their profession effectively. PMs should possess a full range of tools, skills, and aptitudes that are required for the position. While it is true that competence, and specifically Translation Competence (TC), has been the subject of research by numerous scholars since its inception as a discipline (see Wilss 1976; Bell 1991; Pym 1993, 2003; Toury 1995; Kiraly 1995; Hansen 1997; Hurtado Albir 1996a; Kelly 2002, 2005, 2008, to name a few), for the purposes of this article, *competence* is understood as defined below:

[A] complex *know how to act* resulting from integration, mobilisation and organisation of a combination of capabilities and skills (which can be cognitive, affective, psycho-motor or social) and knowledge (declarative knowledge) used efficiently in situations with common characteristics (Lasnier 2002, as cited in Hurtado Albir 2017, 14).

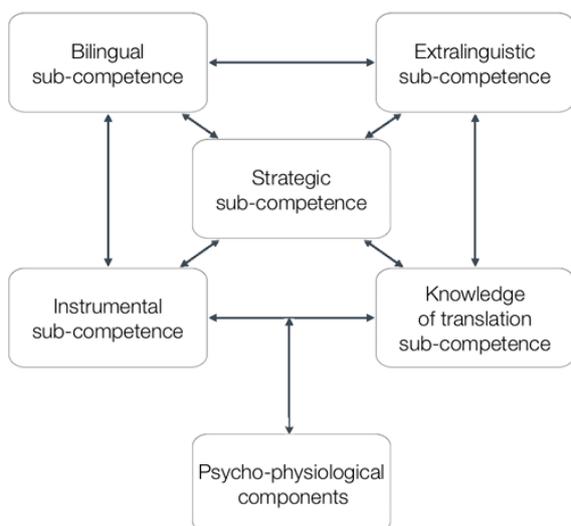
For this article, it is important to consider TC from a theoretical perspective, even though the main focus is not on the translator but on the PM. However, given the duties and responsibilities performed by the PM, there is no doubt that they must have a

background in T&I (refer to Q4 of Appendix I). In this sense, we agree with the viewpoints presented by Plaza-Lara (2018a) and Arevalillo Doval (2002) concerning PMs who do not have training in translation:

In such cases, they will find it challenging to understand the day-to-day issues in our industry, especially considering the common lack of awareness among clients about translation, which can lead to unrealistic and problematic job requests. (Arevalillo Doval 2002, 13)

Regarding TC, there are currently multiple models that cover the different sub-competences needed for professional translators. One of the most relevant models in our field is the model presented by the PACTE group (Process in the Acquisition of Translation Competence and Evaluation) (2003, 2017, 2020), led by Hurtado Albir. They proposed a comprehensive holistic model that is worth considering, as they conducted an empirical and experimental research on TC that validated this model (refer to Hurtado Albir 2017):

Figure 2. *TC Holistic Model (PACTE 2003, 60, 2017, 41, as cited in PACTE 2020, 110).*



As described in the model presented by PACTE (2003, 2017, 2020), TC comprises different interrelated sub-competences, namely (PACTE 2003, 2017, 39-40):

- *Bilingual sub-competence*. Predominantly procedural knowledge required to communicate in two languages. It comprises pragmatic, sociolinguistic, textual, grammatical and lexical knowledge in the two languages. It includes the specific ability to control interference when switching between two languages.
- *Extralinguistic sub-competence*. Predominantly declarative knowledge, both implicit and explicit, about the world in general and specific areas. It comprises: (1) bicultural knowledge (about the source and target cultures); (2) general world knowledge; and (3) subject knowledge (field-specific).

— *Knowledge of translation sub-competence*. Predominantly declarative knowledge, both implicit and explicit, about what translation is and aspects of the profession.

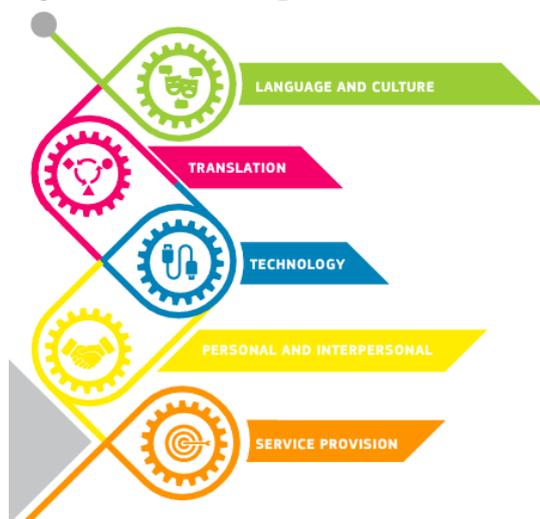
— *Psycho-physiological components*. Different types of cognitive and attitudinal components and psycho-motor mechanisms. They include: (1) cognitive components such as memory, perception, attention and emotion; (2) attitudinal aspects such as intellectual curiosity, perseverance, rigour, critical spirit, motivation, knowledge about, confidence in and the capability to measure one's own abilities; and (3) abilities such as creativity, logical reasoning, analysis and synthesis.

— *Instrumental or professional sub-competence*. Predominantly procedural knowledge related to the use of documentation resources and information and communication technologies applied to translation and translation technologies.

— *Strategic sub-competence*. Procedural knowledge for guaranteeing the efficiency of the translation process and solving problems encountered. This is an essential sub-competence that affects all the others in that it creates links between the different sub-competences as it controls the translation process.

Another model that needs to be considered in the discussion of TC is the one presented by the European Master's in Translation (EMT) network. This model was initially published in 2009, followed by a substantial redrafting in 2017, and most recently updated and published in 2022. Considered complementary to the PACTE group model, the EMT Competence Framework (2022) “focus on new demands, including those stemming from technological changes in the translation industry, artificial intelligence, and social media” (Eraković and Radić Bojanić 2023, 126):

Figure 3. *EMT Competence Framework (2022, 4)*



The model presented by the EMT (2022) defines five main areas of competence:

— *Language and culture*. Transcultural and sociolinguistic awareness and communicative skills. This competence encompasses all the general or language-

specific linguistic, sociolinguistic, cultural and transcultural knowledge and skills that constitute the basis for advanced translation competence.

— *Translation*. Strategic, methodological and thematic competence. It should be understood in the broadest sense, encompassing not only the actual meaning transfer phase between two languages (interlingually), including the use of pivot languages, or within the same language (intralingually), but also all the strategic, methodological and thematic competences.

— *Technology*. Tools and applications. This competence includes all the knowledge and skills used to implement and advise on the use of present and future translation technologies within the translation process.

— *Personal and interpersonal*. This competence area includes all the generic skills (soft skills) that enhance graduate adaptability and employability.

— *Service provision*. This competence covers all the skills relating to the implementation of translation and, more generally, to language services in a professional context – from awareness of clients, commissioners and users and negotiation through to project management and quality assurance.

On the other hand, on the topic of project management, Plaza-Lara (2018a) conducted a study that analyzed a corpus of job advertisements posted online. The study compiled both Spanish and international advertisements. Using the holistic model of TC presented by the PACTE group (2003, 2017, 2020) as a starting point, the author proposes a competence model specifically tailored for project management:

Table 1. *PM Competence Model (Plaza-Lara 2018a, 527-528)*

Bilingual sub-competence	Knowledge of translation sub-competence	Instrumental sub-competence
Foreign language proficiency	Execution of administrative tasks	Advanced computer knowledge
English proficiency	Commercial skills	Preparation and management of files
Linguistic QA	Preparation of reference material	Basic computer knowledge
Translation	Comprehension of instructions	Document management skills
Strategic sub-competence	Psycho-physiological components	
Teamwork	Communication skills	
Client or vendor interaction	Ability to work under pressure	
Time management	Organizational skills	
Problem-solving	Attention to detail	
Project coordination from start to finish	Motivation	
Multitasking	Autonomy	
Analytical skills	Interpersonal skills	
Quality analysis, cost, and deadline management	Proactive attitude	
	Positive attitude	
	Adaptability	
	Leadership	
	Responsibility	

As mentioned by the author, the preceding table does not represent a definitive competence model but rather a "first attempt to delineate the competences of a translation project manager" (Plaza-Lara 2018a, 528). When comparing the model proposed by PACTE for TC (2003, 2017, 2020) and this initial approach by Plaza-Lara (2018a) in the context of project management, the following characteristics of project management competences can be identified:

— PMs must have a high level of proficiency in either a foreign language or English (Plaza-Lara 2018a, 522).

— PMs should have a combination of commercial, communication, and administrative skills. More specifically, "communicative skills, although nowadays desired by employers in almost all professions and spheres, are crucial for PMs" (Motiejūnienė and Kasperavičienė 2019, 167).

— PMs should possess strong teamwork and coordination skills. "Project management is about coordination, planning, and control techniques" (Rico Pérez 2002, 38).

— PMs should demonstrate a proactive and positive attitude, as well as motivation towards the team, clients, and other professionals they work closely with (Fuentes-Pérez 2023).

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— PMs are responsible for the entire process, and as such, they are expected to have time management and problem-solving aptitudes (Fuentes-Pérez 2023; Motiejūnienė and Kasperavičienė 2019).

— PMs should possess computer knowledge, as their work tools are predominantly computer-based (Plaza-Lara 2018a, 523-524).

As stated earlier, we strongly believe that PM training should be incorporated into T&I university programs. While it is true that not all sub-competences of PMs align with those of translators, the bilingual and translation knowledge sub-competences inherent in the PM's role are compelling evidence of the intertwined nature of project management and translation in terms of training.

2 Analysis of T&I Degree Programs

In Spain, university studies in T&I have been offered since the 1970s when the first four institutions dedicated to this discipline were established: the University Institute of Modern Languages and Translators at the Complutense University of Madrid (1974), the University Institute of Translators and Interpreters (EUTI) in Barcelona-Bellaterra (1972), the EUTI in Granada (1979), and the EUTI in Las Palmas (1988) (Benítez Eiroa 1992). Since then, the University Degree in Translation and Interpreting was established in 1991, followed by the implementation of the Bologna Declaration in 1999. These developments, along with the establishment of the European Higher Education Area (EHEA) in Spain, have led to the introduction of Bachelor's Degrees and Dual Degrees in T&I.

Therefore, at the time of conducting this research (November 2023), there were a total of 28 bachelor's degree programs and 16 dual degree programs related to T&I (Registry of Universities, Sources, and Degrees [RUCT] 2023). These programs are available in 13 autonomous communities in Spain: Andalusia, Aragon, the Canary Islands, Cantabria, Castile and León, Castilla-La Mancha, Catalonia, the Community of Valencia, Galicia, La Rioja, Madrid, Murcia, and the Basque Country.

Initially, the study focused on conducting observational research on 10 out of the 28 T&I Bachelor's Degrees available in Spain. However, because there is increasing interest in this new professional role nationwide and to have a comprehensive understanding of project management training across the entire country, it was considered necessary to revise the scope. Therefore, the analysis was extended to all 28 degree programs instead, which included both public and private universities. The only limitation of this study is that it did not consider dual degrees or degrees that were discontinued or were about to be discontinued.

With these study parameters in place, the following list based on the degree programs provided by RUCT (2023) has been compiled. The table below shows the degree programs ordered by autonomous community:

Table 2. *List of the 28 current T&I degree programs offered by public and private universities in Spain (adapted from RUTC 2023)*

Autonomous community	University	Degree Program
Andalusia	Universidad de Córdoba (UCO)	Bachelor's in Translation and Interpreting
	Universidad de Málaga (UMA)	Bachelor's in Translation and Interpreting
	Universidad de Granada (UGR)	Bachelor's in Translation and Interpreting
	Universidad Pablo de Olavide (UPO)	Bachelor's in Translation and Interpreting
Aragon	Universidad San Jorge (USJ)	Bachelor's in Translation and Intercultural Communication
Basque Country	Universidad del País Vasco/Euskal Herriko Unibertsitatea (UPV/EHU)	Bachelor's in Translation and Interpreting
Canary Islands	Universidad de Las Palmas de Gran Canaria (ULPGC)	Bachelor's in Translation and Interpreting
Cantabria	Universidad Europea del Atlántico (Uneatlántico)	Bachelor's in Translation and Interpreting
Castile and León	Universidad de Salamanca (USAL)	Bachelor's in Translation and Interpreting
	Universidad de Valladolid (UVa)	Bachelor's in Translation and Interpreting
Castilla-La Mancha	Universidad de Alcalá (UAH) ³	Bachelor's in Modern Languages and Translation
Catalonia	Universitat Autònoma de Barcelona (UAB)	Bachelor's in Translation and Interpreting
	Universidad de Vic-Universidad Central de Cataluña (UVic-UCC) and Universitat Oberta de Catalunya (UOC)	Bachelor's in Translation, Interpreting, and Applied Languages
	Universidad Pompeu Fabra (UPF)	Bachelor's in Translation and Interpreting
Community of Valencia	Universidad de Alicante (UA)	Bachelor's in Translation and Interpreting
	Universitat de València (UV)	Bachelor's in Translation and Interlinguistic Mediation
	Universidad Europea de Valencia (UEV)	Bachelor's in Translation and Intercultural Communication
	Universitat Internacional Valenciana (VIU)	Bachelor's in Translation and Interpreting
	Universidad Jaume I de Castellón (UJI)	Bachelor's in Translation and Interpreting

³ It should be noted that UAH's degree should be considered as a single degree program. It appears twice in the list, located in two different autonomous communities (Madrid and Castilla-La Mancha), since its campus is split between both areas.

Galicia	Universidade de Vigo (UVigo)	Bachelor's in Translation and Interpreting
La Rioja	Universidad Internacional de La Rioja (UNIR)	Bachelor's in Translation and Interpreting
Madrid	Universidad Complutense de Madrid (UCM)	Bachelor's in Translation and Interpreting
	Universidad Europea de Madrid (UEM)	Bachelor's in Translation and Interpreting
	Universidad Autónoma de Madrid (UAM)	Bachelor's in Translation and Interpreting
	Universidad Pontificia Comillas (UPCO)	Bachelor's in Translation and Interpreting
	Universidad Rey Juan Carlos (URJC)	Bachelor's in Translation and Interpreting
	Universidad de Alcalá (UAH)	Bachelor's in Modern Languages and Translation
Murcia	Universidad de Murcia (UMU)	Bachelor's in Translation and Interpreting
	Universidad Católica San Antonio (UCAM)	Bachelor's in Translation and Interpreting

2.1 Translation Project Management in University Programs

Once the degree programs were listed, the next step in our research was to analyze the syllabus for each degree mentioned in the previous list. The results obtained are shown as follows:

Table 3. *TPM courses in Spanish T&I Degree Programs*

Autonomous community	University	Do they offer TPM?
Andalusia	Universidad de Córdoba (UCO)	No
	Universidad de Málaga (UMA)	No
	Universidad de Granada (UGR)	No
	Universidad Pablo de Olavide (UPO)	No
Aragon	Universidad San Jorge (USJ)	No
Basque Country	Universidad del País Vasco/Euskal Herriko Unibertsitatea (UPV/EHU)	No
Canary Islands	Universidad de Las Palmas de Gran Canaria (ULPGC)	No
Cantabria	Universidad Europea del Atlántico (Uneatlántico)	No
Castile and León	Universidad de Salamanca (USAL)	Yes
	Universidad de Valladolid (UVa)	Yes
Catalonia	Universitat Autònoma de Barcelona (UAB)	No
	Universidad de Vic-Universidad Central de Cataluña (UVic-UCC) and Universitat Oberta de Catalunya (UOC)	No
	Universidad Pompeu Fabra (UPF)	No
Community of Valencia	Universidad de Alicante (UA)	No
	Universitat de València (UV)	No

	Universidad Europea de Valencia (UEV)	No
	Universitat Internacional Valenciana (VIU)	Yes
	Universidad Jaume I de Castellón (UJI)	No
Galicia	Universidade de Vigo (UVigo)	No
La Rioja	Universidad Internacional de La Rioja (UNIR)	Yes
	Universidad Complutense de Madrid (UCM)	Yes
	Universidad Europea de Madrid (UEM)	No
Madrid	Universidad Autónoma de Madrid (UAM)	Yes
	Universidad Pontificia Comillas (UPCO)	Yes
	Universidad Rey Juan Carlos (URJC)	No
	Universidad de Alcalá (UAH)	Yes
Murcia	Universidad de Murcia (UMU)	Yes
	Universidad Católica San Antonio (UCAM)	No

For the purposes of this article, for a course to be qualified as a comprehensive course in TPM, it was deemed essential for the term *project management* to be included in the name of the course, or, alternatively, *management of translation services* or *companies*. In this regard, the study did not take into consideration the courses offered by some universities, such as UCO, UA, and UV. These universities offer programs that cover topics related to TPM, but these are included as part of the courses of *Professional Tools for Translation*, *General Direct Translation*, and *The Translator’s Professions*, respectively.

The observational study of the university degree programs listed above revealed the following results:

Table 4. *T&I Degree Programs in Spain that include TPM courses*

Spanish universities that offer T&I degrees	Spanish universities that include TPM courses	Percentage
28	9	32.1%

The next stage of the research aimed to examine these courses in order to determine if they were offered as elective or required courses. The academic year in which the courses were taught was also included in the analysis:

Table 5. *Academic year and nature of course*

Autonomous community	University	Course	Academic year
Castile and León	Universidad de Salamanca (USAL)	Required	Year 4
	Universidad de Valladolid (UVa)	Elective	Year 4
Community of Valencia	Universitat Internacional Valenciana (VIU)	Required	Year 4
La Rioja	Universidad Internacional de La Rioja (UNIR)	Required	Year 4
Madrid	Universidad Complutense de Madrid (UCM)	Required	Year 4
	Universidad Autónoma de Madrid (UAM)	Elective	Year 4
	Universidad Pontificia Comillas (UPCO)	Elective	Year 4
	Universidad de Alcalá (UAH)	Required	Year 3
Murcia	Universidad de Murcia (UMU)	Elective	Year 3

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These results are expressed as percentage as follows:

Table 6. *Academic year and nature of course expressed as percentage*

Spanish universities that include TPM courses	Required course	Elective course	Year 3	Year 4
9	5 (55.6%)	4 (44.4%)	2 (22.2%)	7 (77.8%)

On the other hand, this study also aimed to determine the specific course names used for these courses. In this sense, it became evident that there was no uniform naming convention across all nine universities:

Table 7. *Name of TPM courses*

Autonomous community	University	Name of course
Castile and León	Universidad de Salamanca (USAL)	Terminology and Project Management
	Universidad de Valladolid (UVa)	Translation Project Management
Community of Valencia	Universitat Internacional Valenciana (VIU)	Creation and Management of Translation Companies
La Rioja	Universidad Internacional de La Rioja (UNIR)	Translation Project Management
Madrid	Universidad Complutense de Madrid (UCM)	Translation, Interpreting, and Profession. Project Management
	Universidad Autónoma de Madrid (UAM)	Translation Project Management and New Technologies: Professional Market of T&I
	Universidad Pontificia Comillas (UPCO)	Translation Project Management
	Universidad de Alcalá (UAH)	Translation Project Management
Murcia	Universidad de Murcia (UMU)	Professional Management of Translation and Interpreting Services

Having collected this data, the study was then directed to the training of students in TPM. To accomplish this, the syllabi of the courses mentioned in Table 7 were assessed to determine if the training in TPM corresponds with the essential competences required for this profession.

In this respect, both the content and competences that students are expected to acquire upon completing each of the nine courses mentioned above were compiled. Except for UNIR and UPCO, which we did not have access to, the syllabi for TPM courses of the other seven universities were successfully examined. These have been categorized based on the project management competence framework proposed by Plaza-Lara (2018a, 527-528).

Table 8. *Content categorization of the analyzed syllabi based on the PM competence model suggested by Plaza-Lara (2018a)*

Bilingual sub-competence
— Phraseology in specialized languages (USAL).
— Ability to understand and express oneself accurately and clearly at the C1 level of the Common European Framework of Reference for Languages, as well as the ability to translate from English to Spanish (UAH).
— Analyzing and commenting on translation projects with a focus on QA and compliance with relevant regulations and standards (UAH).
— Appropriate use of language norms and idiomatic expressions in all working languages, both oral and written, and the use of relevant computer tools if necessary (UCM).
— Proficiency in the Spanish language (UCM).
— Terminology for Translators and Interpreters (UCM/UVa).
— Understanding and working with basic concepts of terminology theory (UCM).
— Conducting QAs (UVa).
— Ability to successfully translate texts to a foreign language (VIU).
— Mastering the mother tongue in all its spoken and written forms (UAM).
Knowledge of translation sub-competence
— Competence in handling terminology and translation memory exchange formats (USAL).
— Identifying and applying concepts and tools to TPM (UAH).
— Comprehensive understanding of the translation process from start to finish (UCM).
— Adequate comprehension of the GILT concept: globalization, internationalization, localization, and translation (UCM).
— Understanding project management and design (UVa).
— Consistent adherence to deadlines and comprehension of project instructions (UVa).
— Application of the ISO standard on translation (VIU).
— Application of knowledge to practical scenarios (UAM).
— Comprehensive understanding of the professional aspects of the T&I market, including awareness of the social role of the translator and interpreter (UAM).
— Gaining an understanding of concepts related to translation management (UAH).
Instrumental sub-competence
— Acquiring knowledge and applying a terminology work methodology: building a textual corpus, extracting terms with associated information, and coding information for creating terminological entries in translation projects (USAL).
— Information retrieval for terminology work: consulting the main sources for term acquisition and terminological documentation (USAL).
— Searching for bilingual documentation and managing translation memories (USAL).
— Proficiency in file format conversion and layout (USAL).
— Ensuring consistency and accuracy in handling complex lexical subsets and presenting them within terminological databases (USAL).
— Development of skills for searching and using specialized and bibliographic tools and resources (UAH).
— Effective use of well-known TPM tools (UAH).
— Evaluating and using general and specialized dictionaries, glossaries, and terminological databases in any format (UCM).
— Excellent handling of bitext processing and alignment (UCM).

- Acquiring knowledge, managing, and assessing sources and resources of information and documentation (UVa).
- Ability to use documentary resources and develop appropriate strategies for the use of available sources of information (UAM).
- Mastering the use of computer technologies applied to translation through practical experience with software programs (UAM).
- Applying documentary techniques (lexicography, terminology, parallel texts) and being able to self-assess the various documentary resources applicable to translation and interpretation (UAM).
- Proficiency in terminology management programs and translation memory tools commonly used in terminology and computer-assisted translation (USAL).
- Familiarity with CAT technologies (UCM).
- Technologies Applied to Translation and Interpreting (UCM).
- Understanding and managing translation memories: workflow, processes, and formats (UCM).
- Utilization of the latest technologies applied to T&I: management systems, terminology management systems, CAT tools, machine translation (MT), or post-editing (PE), among others (UVa).
- Effective use of virtual environments and technologies (UVa).
- Ability to apply new technologies to the T&I industry (UAM).

Strategic sub-competence

- Engagement in group work (USAL).
- Project organization, task division, and establishment of schedules (USAL).
- Promoting teamwork (UAH/UCM/UVa).
- Awareness of the structure of complex tasks and assignments and development of such skills (UAH).
- Recognizing the importance of a coordinated approach to managing projects involving extensive texts (UAH).
- Understanding the influence of aspects such as resources, costs, and QA in project management (UAH).
- Understanding the different agents and professional profiles involved in a translation project (UAH).
- Describing and explaining basic concepts, methods, procedures, and techniques for TPM from the initial stage (budget preparation) to completion (issuing invoices) (UAH/VIU/UAM).
- Effective time management and organization to optimize professional practice (UMU).
- Developing leadership and teamwork skills (UMU).
- Effective time, stress, and workload management (UVa).
- Interacting in a professional and work environment (UAM).

Psycho-physiological components

- Critical assessment and project organization skills (USAL).
- Developing independent, critical, and self-critical thinking based on evidence (UAH).
- Promoting autonomous learning and awareness of knowledge use and recycling (UAH).
- Developing self-assessment and self-improvement skills (UAH).
- Encouraging awareness and respect for cultural diversity and different opinions, as well as appreciation of academic integrity (UAH).
- Acquisition of knowledge through self-directed learning (UCM).
- Communicating ideas, information, problems, and solutions (UMU/VIU).

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- Critical reasoning (UVa/UAM).
 - Gradually acquiring autonomy in the learning process (UAM).
 - Developing awareness of the need for a proactive and responsible attitude in cooperative team working environments (UAM).
 - Making rational decisions and adapting quickly to new situations (UAM).
-

Regarding the bilingual sub-competence, there seems to be a general agreement on the importance of being proficient in both the Spanish language and the foreign language used in the workplace. Nevertheless, it is worth mentioning that only UAH and UVa explicitly address the necessity of linguistic QA skills, which is a crucial aspect of a PM's role, as discussed earlier. Moreover, though certain universities mention terminology for translators and interpreters (UCM and UVa), it does not seem to be a primary focus for the Spanish university in terms of TPM. It can be determined that the four components of this sub-competence, as laid out in the framework proposed by Plaza-Lara (2018a), are mirrored in the observed Spanish universities.

In terms of knowledge of translation sub-competence, there is an emphasis on the importance of understanding instructions: “Consistent adherence to deadlines and comprehension of project instructions” (UVa); “Comprehensive understanding of the translation process from start to finish” (UCM); “Understanding project management and design” (UVa). However, it is worth noting that none of the courses address the importance of acquiring commercial skills or administrative tasks, as suggested by Plaza-Lara (2018a) in her project management competence framework. Given that TPM includes both administrative and commercial aspects, the absence of these elements in university training may be a cause for concern.

As Table 8 shows, the instrumental sub-competence is undoubtedly the most complete in terms of components. Regarding this sub-competence, Spanish universities agree that PMs should have a wide range of basic and advanced computer skills. This includes abilities such as file format conversion and layout (USAL), as well as expertise in handling bitext processing and alignment (UCM). PMs should also be proficient in using and applying documentary resources and techniques (UAH/UAM/UCM), as well as in using and managing virtual environments and translation memories and technologies, like CAT tools. However, it should be noted that only one university (UVa) states that PMs should be familiar with using and applying the latest services in the industry, such as MT and PE.

In terms of strategic sub-competence, it is remarkable that most of the courses emphasize and promote teamwork, which is essential for TPM. Attention is particularly given to time management—“Project organization, task division, and establishment of schedules” (USAL), “Effective time, stress and workload management” (UVa)—as well as to the ability to analyze and coordinate projects from start to finish—“Understanding the importance of a coordinated approach to managing projects involving extensive texts” (UAH); “Describing and explaining basic concepts, methods,

procedures, and techniques for TPM from the initial stage (budget preparation) to completion (issuing invoices)" (UAH/VIU/UAM)—. However, it should also be noted that none of the courses address skills related to dealing with clients or vendors, except for UAM's competence of "Interacting in a professional and work environment". There is also no explicit mention of PMs' multitasking ability.

Lastly, certain universities, particularly UAH and UAM, cover key aspects of TPM related to psycho-physiological components such as autonomy, proactivity, and critical thinking and reasoning. Even though communication is the most requested soft skill by translation companies all around the globe (Fuentes-Pérez 2023), only two universities explicitly state that PMs must be able to communicate ideas, information, problems, and solutions (UMU/VIU). Similarly, skills such as the ability to work under pressure or attention to detail are also missing from the list, especially considering that the latter is ranked as the third most demanded soft skill in TPM (Fuentes-Pérez 2023).

Conclusions

While TPM is a profession that is increasingly in demand in the labor market (Quijano Peña 2022), Spanish universities do not seem to be able to meet this demand, at least at the undergraduate level. As is evident from the results obtained, out of the 28 Bachelor's Degrees related to T&I in Spain, only 9 universities include TPM courses in their curricula. This indicates that only 32.1% of Spanish universities provide training on TPM. As a result, in autonomous communities such as Andalusia, Aragon, the Basque Country, the Canary Islands, Cantabria, and Catalonia, there appears to be a lack of comprehensive TPM training at the undergraduate level. Nevertheless, it should also be pointed out that TPM training is available at the postgraduate level in some Spanish universities. In this regard, we would like to highlight the Master's Degree in International Translation Project Management (UEM) and the Online Expert Diploma in Computer-Assisted Translation and Project Management (UOC).

Of the 9 universities mentioned above, 55.6% require undergraduate students to take TPM as a compulsory course, while 44.4% offer it as an elective course. Although this distribution seems to be balanced, these figures indicate that there is still much work to be done when it comes to TPM training. The fact that almost half of the universities believe that it should not be compulsory results in many students not taking TPM as part of their training. On the other hand, there seems to be a consensus in the academic year in which TPM is taught. Specifically, 77.8% of universities offer the course in Year 4, while only 22.2% offer TPM in Year 3. In this sense, it is remarkable that no Spanish university teaches TPM in Year 1 or Year 2.

Regarding the content of TPM courses, it can be observed that the bilingual, knowledge of translation, and instrumental sub-competences are, generally speaking, adequately addressed by universities, providing a solid foundation for future PMs. However, there

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are minor areas of improvement required in these areas. Regarding the strategic and psycho-physiological sub-competences, it can be observed that there is a tendency to prioritize acquiring management and coordination skills over certain interpersonal skills, such as communication, multitasking, or attention to detail, which are highly demanded by translation companies.

In line with this data, there does not appear to be a consistent approach when it comes to how TPM training is delivered to undergraduate students. Competences and course content differ among universities, and there is a need for improvement in addressing critical aspects of TPM, including client and vendor interaction, administrative skills, and soft skills. Therefore, there seems to be a strong need for enhanced uniformity and comprehensive education in TPM across Spanish universities.

Bibliography

- Arevalillo Doval, Juan José. 2002. Y tú, ¿traduces o proyectas? In: La linterna del traductor. 2: pp. 11-18. <https://campus.usal.es/~doc-localizacion/biblio/arevalillo.pdf>.
- Arevalillo Doval, Juan José. 2004. A propósito de la norma europea de calidad para los servicios de traducción. In: González, Luis et al. Actas del II Congreso “El español, lengua de traducción”. Brussels: ESLEtRA, pp. 89-100.
- Arevalillo Doval, Juan José. 2016. Gestión de proyectos, control de calidad y categorización de errores a partir del proceso de revisión. Unpublished PhD dissertation. Málaga: Universidad de Málaga.
- Asociación Nacional de Empresas de Traducción e Interpretación (ANETI). 2022. ¿Cuántas empresas de traducción existen en España? <https://aneti.es/cuantas-empresas-de-traduccion-existen-en-espana/>. Accessed on: 19 January 2023.
- Association française de Normalisation. 2015. International Standard ISO 17100:2015. Translation Services – Requirements for translation services. La Plaine Saint-Denis Cedex: ISO.
- Benítez Eiroa, Esther. 1992. La situación profesional del traductor en España. In: Fernández Nistal, Purificación (ed.), Estudios de traducción. Valladolid: Universidad de Valladolid, pp. 23-32.
- Bell, Roger T. 1991. Translation and Translating: Theory and Practice. London/New York: Longman.
- Dudi, Petro. 2018. How Translation Companies Operate. <https://www.linkedin.com/pulse/how-translation-companies-operate-petro-dudi/>. Accessed on: 16 November 2023.
- Dunne, Keiran and Dunne, Elena (eds.). 2011. Translation and Localization Project Management: The Art of the Possible. Amsterdam/Philadelphia: John Benjamins.
- Eraković, Borislava and Radić Bojanić, Biljana. 2023. The Intersection of digital and translation competence in students of translation: problem areas and pedagogical interventions. In: Ars & Humanitas. 17(1): pp. 125-138. <https://doi.org/10.4312/ars.17.1.125-138>.
- EMT. 2009. Competence for professional translators, experts in multilingual and multimedia communication. Brussels: European Commission.
- EMT. 2017/2022. Updated version of the EMT competence framework. https://commission.europa.eu/news/updated-version-emt-competence-framework-now-available-2022-10-21_en. Accessed on: 16 November 2023.
- Ferrer Simó, María Rosario. 2016. La gestión de proyectos de traducción audiovisual en España. Seis estudios de caso. PhD dissertation. Valencia: Universitat Jaume I. <http://hdl.handle.net/10803/398416>.
- Flores Acuña, Estefanía. 2012. Gestión de proyectos de traducción en el aula: una experiencia en la clase de Traducción especializada italiano/español/italiano. In: Revista UPO INNOVA. 1: pp. 191-204. <http://hdl.handle.net/10433/2791>.

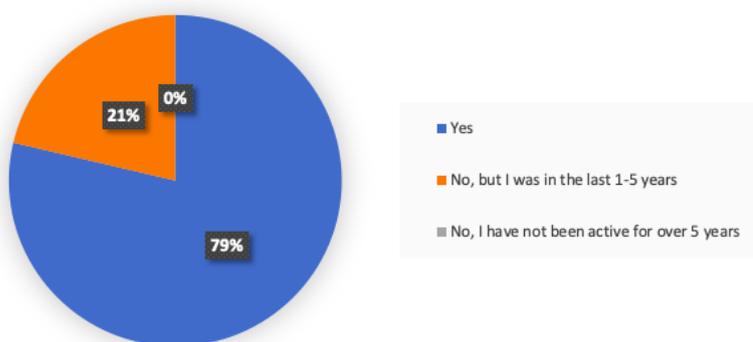
- Fuentes Pérez, Irene. 2023. Translation Project Management: Duties, Competences and Training. What is the scenario like in Spain? In: LION Journal 2(2), pp. 36–61.
- Fuentes-Pérez, Irene. 2023. Top 5 Soft Skills for Translation Project Managers. GALA, 2023. <https://www.gala-global.org/knowledge-center/professional-development/articles/top-5-soft-skills-translation-project-managers>.
- Fuentes-Pérez, Irene. Caracterización del gestor de proyectos en España: un estudio exploratorio-interpretativo sobre sus necesidades en la era digital y sus implicaciones en la formación de traductores. Unpublished PhD dissertation. Alcalá de Henares: Universidad de Alcalá.
- Gili, Núria. 2005. La gestió de projectes de traducció. In: Tradumàtica: traducció i tecnologies de la informació i la comunicació. 3: pp. 1-5. <https://raco.cat/index.php/Tradumatica/article/view/38291>.
- Hansen, Gyde. 1997. Success in Translation. In: Perspectives: Studies in Translation, Theory and Practice. 5(2): pp. 201-210.
- Hurtado Albir, Amparo. 1996a. La enseñanza de la traducción directa “general”. Objetivos de aprendizaje y metodología. In: Hurtado Albir, Amparo (ed.), La enseñanza de la traducción. Castellón: Universitat Jaume I. pp. 31-55.
- Hurtado Albir, Amparo. 1996b. La traductología: lingüística y traductología In: Debates. 1: pp. 151-160. <https://doi.org/10.24310/TRANS.1996.v0i1.2286>.
- Hurtado Albir, Amparo (ed.). 2017. Researching Translation Competence by PACTE Group. Amsterdam: John Benjamins. <https://doi.org/10.1075/btl.127>.
- Instituto Nacional de Estadística (INE). 2023. Empresas por CCAA, actividad principal (grupos CNAE 2009) y estrato de asalariados (antigua estratificación). <https://www.ine.es/jaxiT3/Tabla.htm?t=298&L=0>. Accessed on: 14 November 2023.
- Jáñez, Mónica. 2020. La figura del gestor de proyectos en la agencia de traducción: entrevista a Joan Corrons i Figa. <http://aetioficial.es/es/la-figura-del-gestor-de-proyectos-en-la-agencia-de-traduccion-entrevista-a-joan-corrons-i-figa/>. Accessed on: 20 January 2023.
- Kelly, Dorothy. 2002. Un modelo de competencia traductora: Bases para el diseño curricular. In: Puentes. 1: pp. 9-20.
- Kelly, Dorothy. 2005. A Handbook for Translator Trainers. Translation Practices Explained. Manchester: St. Jerome.
- Kelly, Dorothy. 2008. Training the Trainers: Towards a Description of Translator Trainer Competence and Training Needs Analysis. In: TTR: Traduction, terminologie, rédaction. 21(1): pp. 99-125.
- Király, Donald C. 1995. Pathways to Translation: Pedagogy and Process. Kent: The Kent State University Press.
- Matcha Abombo, Joël E. 2015. La gestión de proyectos (project management) y su implementación en los estudios de Traducción e Interpretación. PhD dissertation. Alcalá de Henares: Universidad de Alcalá. <http://hdl.handle.net/10017/22713>.
- Ministerio de Universidades, Gobierno de España. 2022. Datos y cifras del Sistema Universitario Español. Publicación 2021-2022. Madrid: Secretaría General Técnica del Ministerio de Universidades.
- Motiejūnienė, Jurgita and Kasperavičienė, Ramunė. 2019. Translation project management – an ultimate skill for translators? In: Current Trends in Translation Teaching and Learning E. 6: pp. 160-192. <https://epubl.ktu.edu/object/elaba:48311088/>.
- PACTE. 2003. Building a Translation Competence Model. In: Alves, Fabio (ed.), Triangulating Translation: Perspectives in Process-Oriented Research. Amsterdam: John Benjamins, pp: 43-66.
- PACTE. 2017. PACTE Translation Competence model. In: Hurtado Albir, Amparo (ed.), Researching Translation Competence by PACTE Group. Amsterdam: John Benjamins, pp. 35-41.
- PACTE. 2020. Translation competence acquisition. Design and results of the PACTE group’s experimental research. In: The Interpreter and Translator Trainer. 14(2): pp. 95-233. <https://doi.org/10.1080/1750399X.2020.1732601>.
- Plaza-Lara, Cristina. 2018a. Las competencias del gestor de proyectos de traducción: Análisis de un corpus de anuncios de trabajo. In: Meta. 63: pp. 510-531. <https://doi.org/10.7202/1055150ar>.

- Fuentes Pérez, Irene. 2023. Translation Project Management: Duties, Competences and Training. What is the scenario like in Spain? In: *LION Journal* 2(2), pp. 36–61.
- Plaza-Lara, Cristina. 2018b. Project Management: Defining Competences for Translator Training. In: Bogucki, Łukasz, Pietrzak, Paulina and Kornacki, Michał (eds.), *Understanding Translator Education*. Berlin/Bern/Brussels/New York/Oxford/Warsaw/Vienna: Peter Lang, pp. 193-210. <https://doi.org/10.3726/b15038>.
- Plaza-Lara, Cristina. 2020a. Competencias en traducción del gestor de proyectos: análisis desde la perspectiva de los traductores. In: *Sendebare*. 31: pp. 133-157. <https://doi.org/10.30827/sendebare.v31i0.11301>.
- Plaza-Lara, Cristina. 2020b. How does machine translation and post-editing affect project management? An interdisciplinary approach. In: *Hikma*. 19: pp. 163-182. <https://doi.org/10.21071/hikma.v19i2.12516>.
- Plaza-Lara, Cristina. 2020c. Las competencias de los gestores de proyectos de traducción: un estudio basado en encuesta. In: *Hermeneus*, 22: pp. 311-335. <https://doi.org/10.24197/her.22.2020.311-335>.
- Plaza-Lara, Cristina. 2021. Competences of translation project managers from the academic perspective: analysis of EMT programmes. In: *The Interpreter and Translator Trainer*, 16: pp. 203-223. <https://doi.org/10.1080/1750399X.2021.1987085>.
- Pym, Anthony. 1993. Epistemological problems in translation and its teaching: A Seminar for Thinking Students. Teruel: Caminade.
- Pym, Anthony. 2003. Redefining Translation Competence in an Electronic Age. In *Defence of a Minimalist Approach*. In: *Meta*. 48(4): pp. 481-497.
- Quijano Peña, Paula. 2022. La gestión de proyectos de traducción: una tarea pendiente en los planes de estudio del Grado en Traducción e Interpretación en España. In: *Hikma*. 21, pp. 287-319. <https://doi.org/10.21071/hikma.v21i2.14327>.
- Rico Pérez, Celia. 2002. Translation and Project Management. In: *Translation Journal*. 6: pp. 38-52. <https://translationjournal.net/journal/22project.htm>.
- Rico Pérez, Celia. 2021. *Fundamentos teórico-prácticos para el ejercicio de la traducción*. Granada: Editorial Comares.
- Rico Pérez, Celia and García Aragón, Álvaro. 2016. *Análisis del sector de la traducción en España (2014-2015)*. Madrid: Universidad Europea.
- RUCT. 2023. Registro de Universidades, Centros y Títulos (RUCT): Consulta de títulos. <https://www.educacion.gob.es/ruct/consultaestudios?actual=estudios>. Accessed on: 20 January 2023.
- Tirry, Rudy. 2023. The Translation Industry and Profession – Past, Present and the Future [Conference]. *Translating Europe Forum 2023*, Brussels, Belgium. <https://2023tef.b2match.io/>.
- Toury, Gideon. 1995. *Descriptive Translation Studies – and beyond*. Amsterdam/Philadelphia: John Benjamins.
- Wilss, Wolfram. 1976. Perspectives and Limitations of a Didactic Framework for the Teaching of Translation. In: Brislin, Richard W. (ed.), *Translation applications and research*. New York: Gardner Press. pp. 117-137.

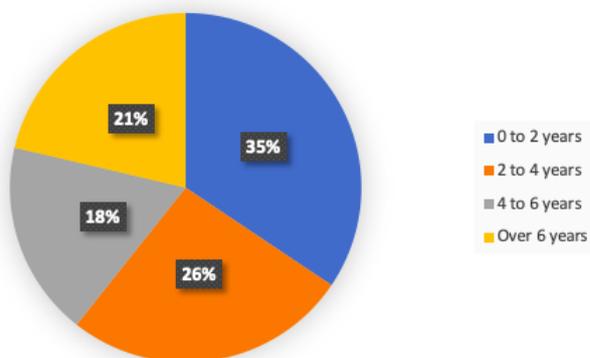
Appendix 1 Survey

This survey was preceded by an informed consent that has not been included in this appendix. All 61 participants agreed to take the survey after reading the information specified in the informed consent. The following is an English translation of the original survey written in Spanish. Please note that only questions relevant to this study have been translated and included in this document.

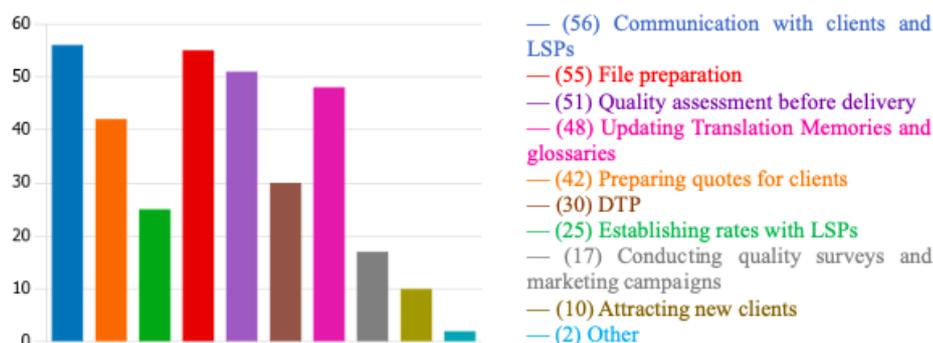
Q1. Are you currently active in the TPM industry?



Q2. How many years of experience do you have in TPM?

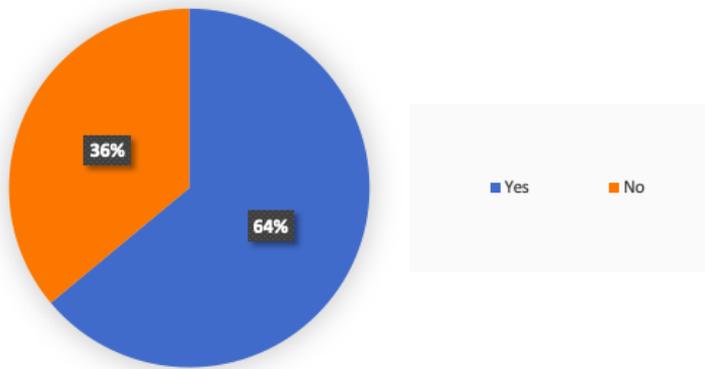


Q3. In addition to TPM, which of the following duties do you perform as a PM? (Please select all that apply)



Fuentes Pérez, Irene. 2023. Translation Project Management: Duties, Competences and Training. What is the scenario like in Spain? In: L10N Journal 2(2), pp. 36–61.

Q4. Do you think training in T&I is necessary to become a PM in the language industry?



Integration of Machine Translation Tools in Software Localization: mission (im)possible?

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Abstract

The use of machine translation tools in various translation related activities has exponentially increased, not only because of the pandemic and post-pandemic context, the growth of the language industry, but also because of the current technological development of machine translation tools. Researchers, translators and developers actively discuss machine translation capabilities, its impact on translation and language, and challenges it brings. However, when it comes to software localization, possibilities of machine translation tools seem overestimated and limited, not only because of the quality of the output the machine translation tools produce, but also because of technical capacities to recognize programming language and handle difficult scenarios. This article aims to introduce possibilities and limitations of integrating machine translation tools in the process of software localization into the Lithuanian language. Here the term “integration” is used as the application of machine translation tools in the workflow of localization so as to speed up the process and help translators, but not as the technological integration when machine translation tools are integrated with computer aided translation (CAT) tools. The article presents an experiment during which several machine translation tools, such as *Google Translate*, *DeepL*, *Vilnius University machine translation tool* and *Tildè machine translation tool*, were tested with the Lithuanian language as the low-resourced language. The four machine translation tools were selected due to their popularity and current development in and for the Lithuanian language (Utka et al. 2020). The machine translation tools were given to translate .rc2 or .txt software-related resource files. The output quality produced in the Lithuanian language was compared in terms of text cohesion, term accuracy, identification of segments to be localized and damaged programming code. Moreover, the machine translation outputs were compared with the output of professional translation and localization CAT tools such as Passolo and Trados. The results showed that none of the machine translation tools used, despite the current integration of artificial intelligence solution, can produce high-quality translated text in the Lithuanian language due to the assumption that the Lithuanian language (with around 3 million speakers) is not commercially attractive. The output produced cannot be applied to speed up or ease localization in terms of the output text quality.

Keywords: software localization, machine translation tools, integration, output, quality

Introduction

Machine translation tools, their current development in terms of implementing different artificial intelligence (AI) solutions, are much discussed in various research papers (Skadiņš et al. 2014; Dew et al. 2018; Pituxcoosuvorn, Ishida, 2018; Rossi, Chevrot, 2019; Hoi, 2020; Rossetti, O'Brien, Cadwell, 2020; Kasperė et al. 2021; Sadadany et al. 2021) that outline possibilities and challenges of applying machine translation tools to ease multilingual and cross-cultural communication, and help users understand specific linguistic content and context in the language that the user is not proficient or does not speak at all. Other researchers (Gaspari et al. 2015; Doherty, 2016; Das et al. 2019; Kenny et al. 2020) examine the development of machine translation tools that have also changed the profile of translation as a profession and have also modified the activities translators-professionals undertake. Instead of actual translation from scratch, post-editing skills of the output, produced by machine translation tools, are identified as one of the core competencies a translator must have, in addition to other technology-related competences. This, in turn, has also changed the competences of translators, as indicated in the translator's competence framework 2022, as introduced by the European Master's in Translation Board at the European Commission (*European Master's in Translation Competence Framework, 2022*). Due to its simple use and easily gained accessibility to different types of information by means of translation, machine translation tools are integrated in various settings such as healthcare, enterprises, the European Commission. Yet, the use of machine translation tools poses some risks in terms of its output quality and impact on human perception. The approach to investigate the impact of machine translation use might be different due to the aim of research. Some publications and research papers (Rimkutė, Kovalevskaitė, 2007; Gaspari et al. 2015; Doherty, 2016; Das et al. 2019; Kenny et al. 2020; Rossetti et al. 2020; Utkā et al. 2020; Kasperė et al. 2021) aim to examine the impact of machine translation tools on translator training, the profession in general, and translation didactics. Whereas other research papers (Yamashita, Ishida, 2006; Cvilikaitė, 2008; Yasouka, Bjorn, 2011; Castilho, 2016; Doherty, 2016; Canfora, Ottman, 2020; Kasperavičienė et al. 2020) focus on the quality of machine translated output, usability, mistakes, and machine translation impact on user perception. If translation-didactics related approach emphasises functional aspects of machine translation output (the quality of the output, post-editing efforts) as a product by focusing different types of text, the research on how machine translation tools might be used in software localization is limited. Though there are many posts on social media networks such as *LinkedIn* or other on how machine translation might help in software localization by speeding up the process, saving localization costs, and aiding translators-localizers, the research that would focus on productivity, usability and efficient use of machine translation in localization is scarce, though several research papers have been observed by *Tidlė* company researchers such as Skadiņš et al. 2014, Skadiņa, 2019 and some

Lithuanian researchers Utkā et al. 2016; Utkā et al. 2020. Taking it into account, this article aims to examine the impact of machine translation and its use in software localization to localize resources and help files into the Lithuanian language as a low-resourced language. This article presents an experiment carried out at Kaunas University of Technology to examine if machine translation tools can be used for more complicated tasks of software localization, i.e., localization of resource and help files. During the research and experiment, an assumption was made that due to constant development and technological advancement, machine translation tools can already provide output texts of reasonable and acceptable quality, since deep learning is embedded as a solution. Moreover, cases when translators, especially novice translators use machine translation for translatable segments and copy them to professional software for translation or localization with an aim to translate texts faster have been also observed, thus, it is interesting to find out if that aids in the process of localization.

Literature review

The research on machine translation tools, their application challenges, advantages, disadvantages and various possibilities of their use has been increasing due to the constant development of machine translation tools, their popularity in terms of user-friendly usability, possibilities to understand information in a language that a user does not speak as well as use machine translation in work related settings, i.e., tourism, medicine, shopping, etc. In addition, many research papers (Kenny, Moorkens, do Carmo, 2020) tackle specific aspects of machine translation use in relation to translation, translator training, ethical and sustainable machine translation, technological solutions, and other factors connected to socio-economic, educational, organizational and technological aspects of machine translation use (Hoi, 2020). The analysis of scientific literature on machine translation-related research papers has demonstrated that many articles and research works focus on the use of machine translation tools in various multilingual and cross-cultural communication related settings, where machine translation is used to aid personal and professional communication and collaboration (Yamashita, Ishida, 2006; Yasouka, Bjorn, 2011; Dew et al. 2018; Pituxcoosuvārn, 2018; Rosi, Chevrot, 2019; Saanady et al. 2021). Another type of research and publications on machine translation focuses on translator training practices, new translation profession related perspectives interlinked with challenges and possibilities of machine translation application in translation activities and practices, or examine machine translation output and its quality in terms of human versus machine translation mistakes and their evaluation (Gaspari et al. 2015; Doherty, 2016; Castilho, 2016; Kenny, Morkens, do Carmo, 2020; Rossetti et al. 2020). Risks and dangers that end-users might face when exhausting the possibilities of machine translation tools also receive the attention of researchers due to the misunderstandings

and pitfalls of machine translated output in various settings (Das et al. 2019; Canfora and Ottmann, 2020).

Machine translation tools and their usability in software localization are also analyzed, but the research is rather limited and even more limited in the investigation of machine translation and its integration in software localization processes with low-resourced languages, which includes the Lithuanian language (Skadiņš et al. 2014; Utkā et al. 2016). It must be mentioned that not much is discussed about how machine translation might be applied to localize help and resource files to complete a full scale software localization. One of the first articles to examine the application of machine translation tools in software localization for low-resourced languages was published by a group of researchers at *Tildė* company (Skadiņš et al. 2014) and aimed at examining the usability and productivity of machine translation tools in software localization. The research results indicated that segments with formatting tags were rendered incorrectly, and the output produced contained many mistakes in improper terminology and phrase use. The researchers admitted the pitfalls of machine translation integration in difficult scenarios, but the use of the tools allowed for an increase in the productivity of translation and localization. Though the research findings were promising and hopeful, no other research work has been carried out regarding further investigations on how machine translation tools could be productively and efficiently applied in software localization into the Lithuanian language. Thus, it might be stated that the scientific investigations in the area of machine translation usability to localize, i.e., to Lithuanise (the terms “*Lithuanise / Lithuanisation*” are frequently applied in the Lithuanian language and context as a Lithuanian counterpart to replace the term “*localize*” and describe the process of software or webpage localization, but not translation) software texts, are rather limited.

However, it must be mentioned that the research on different aspects of machine translation use and its application to translate various texts from English into the Lithuanian and Lithuanian-English languages, and the examination of the output text quality started several decades ago. The first attempts to examine the potential of machine translation in the Lithuanian language in general, classify the main criteria for quality assessment, and give an overview of the most typical mistakes were provided in the research papers of Labutis (2005), Daudaravičius (2006), Rimkutė and Kovalevskaitė (2007, 2008). Cvilikaitė (2008) focused on the analysis of lexical mistakes, the translation of non-equivalent lexical items, by identifying that machine translation quality and non-equivalent word translation do not depend on the discourse and register of the input text. These papers and research works might be described as pre-neural machine translation research and the starting point. The results of the research demonstrated that ordinary nomination conditions machine translation mistakes, i.e., polysemy, homonymy (Cvilikaitė, 2008). Scientists Petkevičiūtė and Tamulynas (2011) provided research insights and described the main

indicators that could be applied to examine machine translation quality in terms of the English-Lithuanian language pair, and enumerated challenges that translators might face with and machine translation tools that could trigger when translating into the Lithuanian language. Further on, more advanced research in terms of machine translation tool use for the Lithuanian language was carried out by Kasperavičienė et al. (2020). A group of researchers at Kaunas University of Technology carried out an extensive examination of machine translation quality assessment by means of an eye-tracking experiment that was applied to determine types of mistakes that would cause understanding difficulties when reading machine-translated text from English into the Lithuanian language. The research results indicated that erroneous machine-translated texts require additional cognitive effort in comparison to error-free texts. Moreover, the perception of lexical errors requires more time and effort to understand a machine-translated text from English into Lithuanian.

In addition, Kasperė et al. (2021) aimed to examine different attitudes towards the usability and quality of machine translated output from English into the Lithuanian language from the perspective of the end-user. The research focused on how Lithuanian end-users apply machine translation tools and view their produced output. The research findings were grounded by the results of a substantial survey carried out in Lithuania in 2021, and involved 402 participants. Both the survey and the research results indicated that *Google Translate* is the best known and most frequently used machine translation tool by Lithuanian users. It is frequently applied for various purposes, since 96,6 percent of respondents identified it as the main machine translation tool. *DeepL*, *Tildē*, *Microsoft* and other were enumerated among other less frequently used machine translation tools (Kasperė et al. 2021). It is important to note that the investigation of the researchers has laid the foundation for further research in terms of machine translation usability, quality inspection from the end-user perspective due to the fact that among the respondents the opinions of translation professionals were included. The research did not focus on the error analysis; yet, the results mentioned above might serve as a starting point to further investigate machine translation application in software localization and this article is one of the first attempts to dwell deeper on machine translation powered software localization and move forward with the research on machine translation integration for the Lithuanian language.

Research methodology

The research methodology applied in this particular paper focuses on the systematic literature review method, so as to provide the grounds for this type of analysis. The aim of the research is to evaluate the possibilities and limitations of machine translation tool integration in the process of software localization, i.e., Lithuanisation. Possibilities of four machine translation tools, such as *Google Translate*, *DeepL*, *Vilnius University*

machine translation tool, and *Tildė machine translation tool*, were examined following the criteria adapted from Multidimensional Quality Metrics (MQM) proposed as a framework (Lommel et al. 2014). The main aspects that participants of the experiment focused on are related to the following MQM error hierarchy, which has been adapted by adding a graphical layout of the source texts. This is mainly related to the ability of machine translation tools to retain the same graphical structure in both source and target or input and output texts when using .txt, .pdf, .hhc, and similar extensions of various resource and help files. Therefore, possible modifications and changes of the input and output texts were examined by considering the following aspects:

- Accuracy
- Fluency (with a focus on correct grammar and punctuation use)
- Terminology (incorrect and inconsistent use of terms)
- Style
- Graphical layout.

It needs to be noted that in this research and several experiments, the productivity of translators in the process of localization was not examined and addressed, due to the primary aim of the research to focus on the possibility of integrating machine translation tools in more complicated scenarios of software Lithuanisation. The research was carried out using two scenarios.

Scenario 1 was related to the localization of resource files from English into Lithuanian using no specialized software of translation technology tools, and opening the file in *Notepad*. The resource files had to be localized and translated using the program. When the localization of the resource file was completed, the localized file was uploaded to *SLD Passolo Translator 2018* or *Passolo 2022* and aligned with the source file so that to perform the analysis of the usability and quality of the produced output.

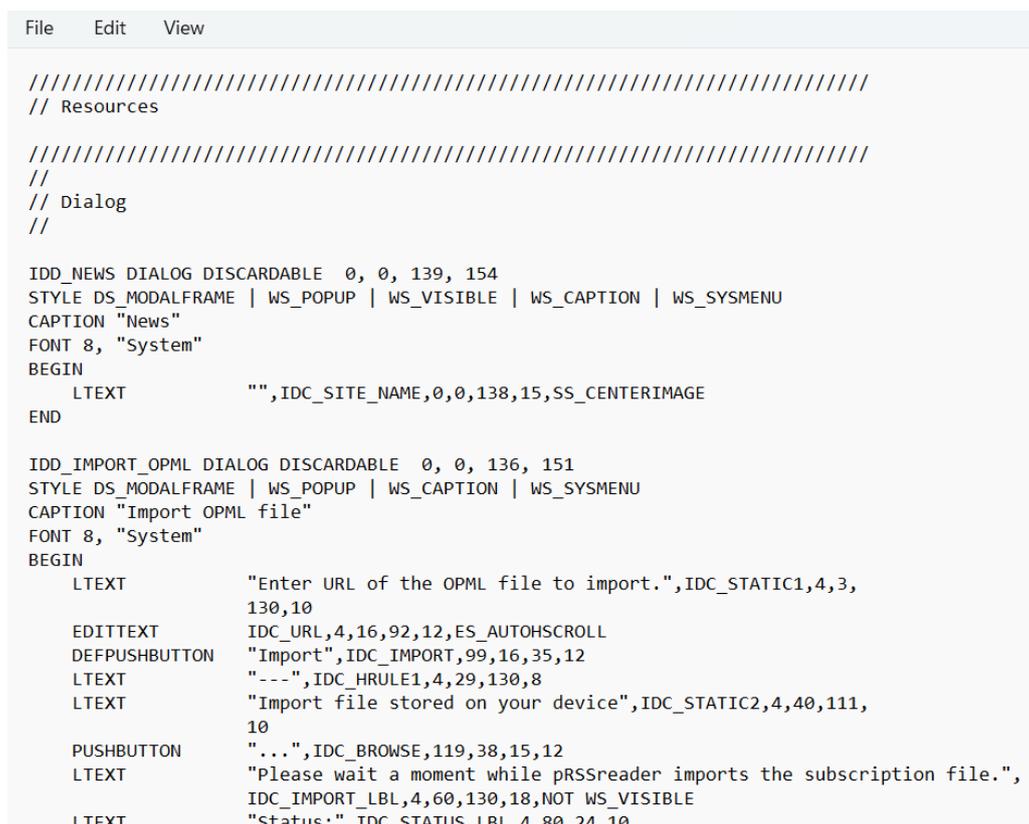
Scenario 2. The resource file (.rc2 file extension) was uploaded to the four machine translation tools (*Google Translate*, *DeepL*, *Vilnius University machine translation tool*, *Tildė machine translation tool*) to test the possibilities of using machine translation tools in software localization and compare their output quality. Since some of the machine translation tools (*Google Translate*, *DeepL*, *Vilnius University machine translation tool*) do not support .txt, .rc2 and similar help and content-related files, the source text was uploaded as a .pdf extension file. During the experiment, the idea that .pdf extension files might cause incorrect segmentation was taken into consideration as well. Participants of the experiments were instructed that .doc, or .docx file extensions should not be used due to the fact that when a .txt file is opened as a Word document, the programming code might be damaged, segments are truncated, and the file cannot be used in subsequent processes of software localization. When the output texts were obtained, they were qualitatively examined and compared in terms of their possible usability for localization processes, as well as the output quality was inspected. In both scenarios, text-to-text segments were tested out and examined. During the first stages

of carrying out scenario 2 in 2021 it was not initially planned to try out generative tools such as *ChatGPT*; however, due to its popularity and the observations that translators start using such generative tools for translation tasks, it was decided to test what output quality the tool would produce when localizing a file from English into the Lithuanian language. Therefore, the trial was completed in 2023.

The experiment design

For the experiment and testing out if neural machine translation tools can be applied to resource and help file localization into the Lithuanian language, an .rc2 file in English was selected. The file was opened in *Notepad* program to perform the analysis of the file to be localized and provide a possibility for the participants of the experiment (translators-localizers) to localize and test out the use of *Notepad* tool. The example of the resource file is presented in the picture below:

Picture 1. The example of the resource file as a source text



```
File Edit View

////////////////////////////////////
// Resources

////////////////////////////////////
//
// Dialog
//

IDD_NEWS_DIALOG DISCARDABLE 0, 0, 139, 154
STYLE DS_MODALFRAME | WS_POPUP | WS_VISIBLE | WS_CAPTION | WS_SYSMENU
CAPTION "News"
FONT 8, "System"
BEGIN
    LTEXT          "", IDC_SITE_NAME, 0, 0, 138, 15, SS_CENTERIMAGE
END

IDD_IMPORT_OPML_DIALOG DISCARDABLE 0, 0, 136, 151
STYLE DS_MODALFRAME | WS_POPUP | WS_CAPTION | WS_SYSMENU
CAPTION "Import OPML file"
FONT 8, "System"
BEGIN
    LTEXT          "Enter URL of the OPML file to import.", IDC_STATIC1, 4, 3,
                  130, 10
    EDITTEXT       IDC_URL, 4, 16, 92, 12, ES_AUTOHSCROLL
    DEFPUSHBUTTON  "Import", IDC_IMPORT, 99, 16, 35, 12
    LTEXT          "----", IDC_HRULE1, 4, 29, 130, 8
    LTEXT          "Import file stored on your device", IDC_STATIC2, 4, 40, 111,
                  10
    PUSHBUTTON     "...", IDC_BROWSE, 119, 38, 15, 12
    LTEXT          "Please wait a moment while pRSSreader imports the subscription file.",
                  IDC_IMPORT_LBL, 4, 60, 130, 18, NOT WS_VISIBLE
    LTEXT          "Status:", IDC_STATUS_LBL, 4, 80, 24, 10
```

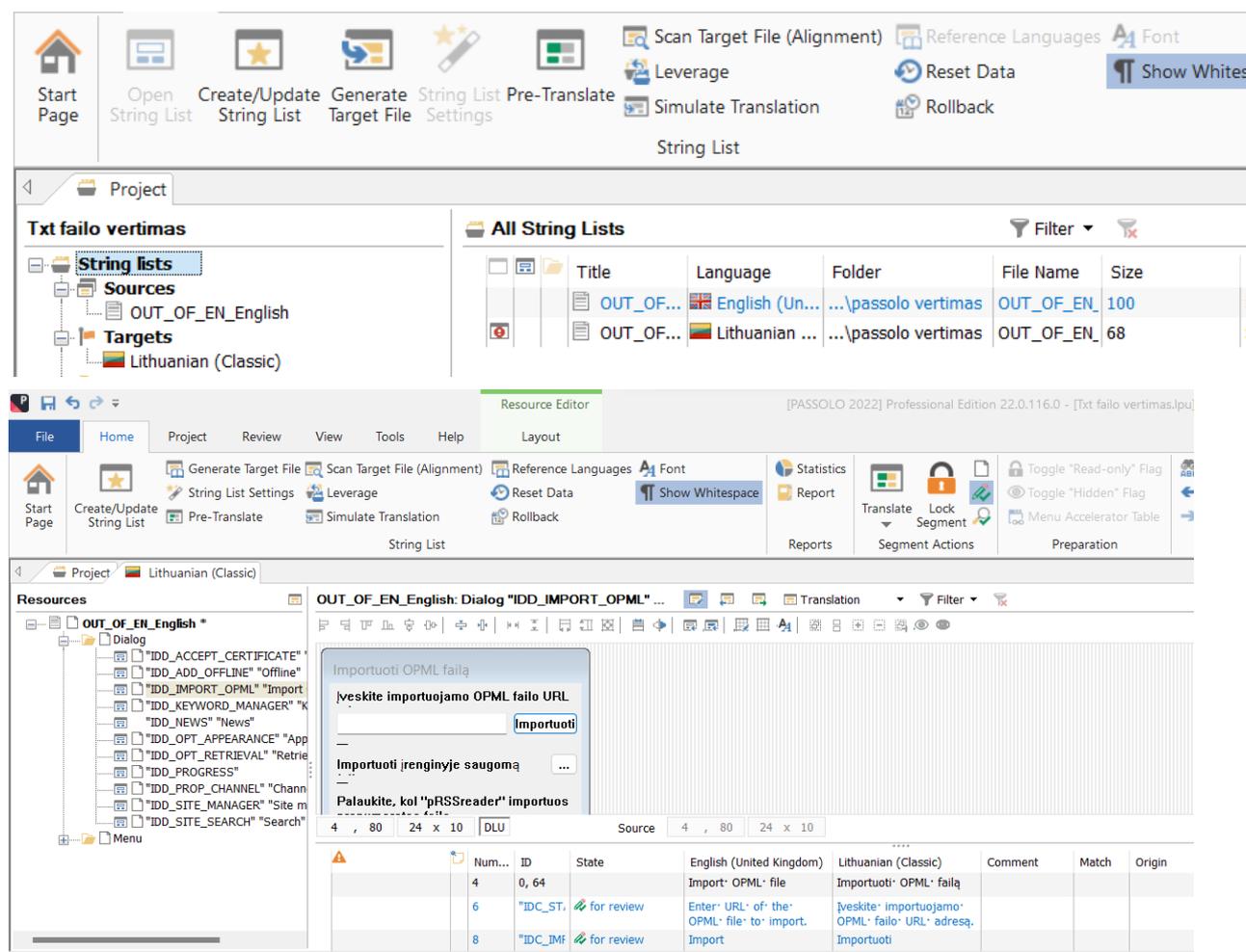
After the localization of the .rc2 file using *Notepad* was completed, the localized target file was opened and aligned in *SDL Passolo 2018* and *SDL Passolo 2022* software, which is typically used in software localization processes. The localized .rc2 file was opened in *Passolo* to examine if translatable segments are not truncated, all Lithuanian diacritics are correctly marked, segments are not too long and fit the indicated number of characters as tab labels and the programming code is not destroyed. The participants

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of the experiment were also asked to try out and localize the provided source file with the help of *Passolo* and compare the difference of using both programs. The rationale for carrying out the experiment that direction is related to the fact that *SDL Passolo 2018* and *SDL Passolo 2022* software is expensive and not so many translators purchase it for localization. Moreover, in cases when localization tasks are outsourced and translators work as freelancers, word-only translation environments are numerous. Therefore, if no contextual information is provided, programming and coding language, available in .txt files and readable in *Notepad* becomes a valuable source of information for translators in further decision-making processes on how segments could be rendered in the target language.

In addition, *SDL Passolo 2018* and *SDL Passolo 2022* software's analysis function was applied to identify the number of strings to be localized into the Lithuanian language. All in all, the localizable file contained 100 strings, where a string could be composed of just one lexical item, such as a word (a term), and the longest one consisting of several sentences, composed of 21 words. It must be noted that *Passolo* recognised both the original .rc2 file and the aligned target file in the Lithuanian language. The picture of .rc2 file as uploaded and aligned in *Passolo* software is presented in the picture below:

Picture 2. *The target .rc2 resource file in the Lithuanian in Passolo 2022*



With an aim to test out machine translation tools in the process of software Lithuanisation, the following machine translation tools were selected: *Google Translate*, *DeepL*, *Vilnius University machine translation tool*, and *Tildė machine translation tool*. The machine translation tools were purposefully selected, due to the fact that some of them, i.e., *Google Translate* and *DeepL* were indicated in the research of Kasperė et al. (2021) as the most popular machine translation tools. *Google Translate* was selected because it is considered to be the most popular and best-known machine translation tool that is widely used for different purposes. Another factor that was important in the selection of *Google Translate* is the fact that it is powered by AI solutions and it is a neural machine translation tool. *DeepL* was applied in the research due to the fact that it is easily accessible and quite often used in comparison to other machine translation tools by professional translators.

Vilnius University machine translation tool was selected for the research and analysis due to the fact that the tool was developed as part of the European Union funded project in 2012–2014. Though the machine translation tool was initially designed as a statistical machine translation tool (www.tilde.lt), it incorporates AI neural network models to solve various translation tasks. Moreover, the tool was developed for the Lithuanian language, selecting English-Lithuanian-English and French-Lithuanian-French language combinations. *Tildė machine translation tool* was chosen since the tool was created to accommodate the needs of the Lithuanian language, in addition to other Baltic languages, and also considers the peculiarities of the Lithuanian language. Furthermore, this machine translation tool is also AI-technology-based, and systemic research has been carried out since the start of the machine translation tool development. Thus, results of the research can be embedded or compared with other forthcoming research works.

Though initially other tools were not considered to be applied in the experiment, in the last stages of the experiment, in 2023, the translation tool provided by a generative tool, i.e., *ChatGPT*, was tested. Yet, the results obtained cannot be further examined, as the experiment with the generative tool mentioned above was tried only several times and still needs to be replicated so that valid data could be produced and examined. The main reasons to try how *ChatGPT translator* reacts to the uploaded English .rc2 file and translates the strings into the Lithuanian language were related to the discussions and possibilities of various generative tools to produce the target file in the Lithuanian language and the fact that novice translators start applying such generative tools in the process of translation as a new translation practice. The author of the research took into consideration the fact that the results received in the process of localizing the source file into the Lithuanian language by means of *ChatGPT translator* could not be identical, yet, it was interesting to compare the quality of the output produced in terms of its readability and usability.

Participants of the experiment and their instruction

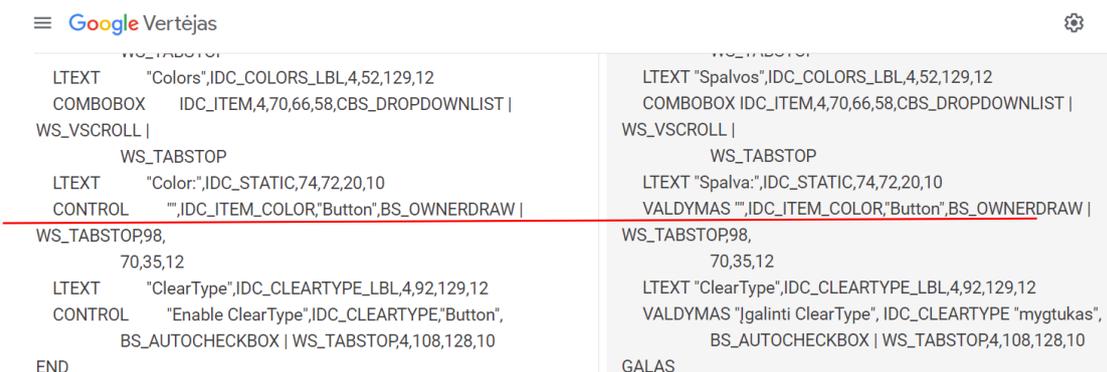
The participants of the experiment were professional translators with a Bachelor's degree in translation or linguistics. Most of them work in several translation agencies or carry out editing and proof-reading tasks in private translation companies and publishing houses. The total number of participants who took part in the experiment is 25 translators. 19 participants were women, and 6 of them were men. In 2021, 10 participants took part in the experiment, in 2022 – 6 and in 2023 – 9. Prior to the experiment and realisation of scenario 1 and 2, all participants were instructed about the procedures and process of how both scenarios should take place. No timing limitations were imposed in terms of duration or specific time setting during which participants of the experiment had to localize the resource file. They were allowed to carry out the Lithuanisation of the file at home. In addition to this, if they had no *Passolo* software, they were provided with it at Kaunas University of Technology. During the first stages of the experiment participants were asked to localize the selected resource file with *Notepad* and after that, upload and align the localized resource file in *Passolo*. Then they were asked to localize the resource file into the Lithuanian language with the four machine translation tools. *ChatGPT translator* was used by the last cohort of participants in 2023.

Results of the research

The experiment carried out returned interesting research findings in terms of comparing the accuracy, fluency, terminology, style and graphical layout of the output file in the Lithuanian language. Comparing the graphical layout of all machine translation tools, *Google Translate*, *Vilnius University machine translation tools*, *Tildè* and *DeepL*, it has been noticed that *Google Translate* and *DeepL* machine translation tools did not retain the graphical structure of the resource file in the Lithuanian language. For example, the structure of the target file was changed, different indentation of segments, spacing or no spacing were maintained in the target file. This might be related to the idea that both machine tools do not support .rc2 or .txt files and the .pdf file extension of the source file might have also caused incorrect segmentation of the localized file. The examples below demonstrate mistakes of machine translation tools in correctly extracting segments to be localized in the Lithuanian language:

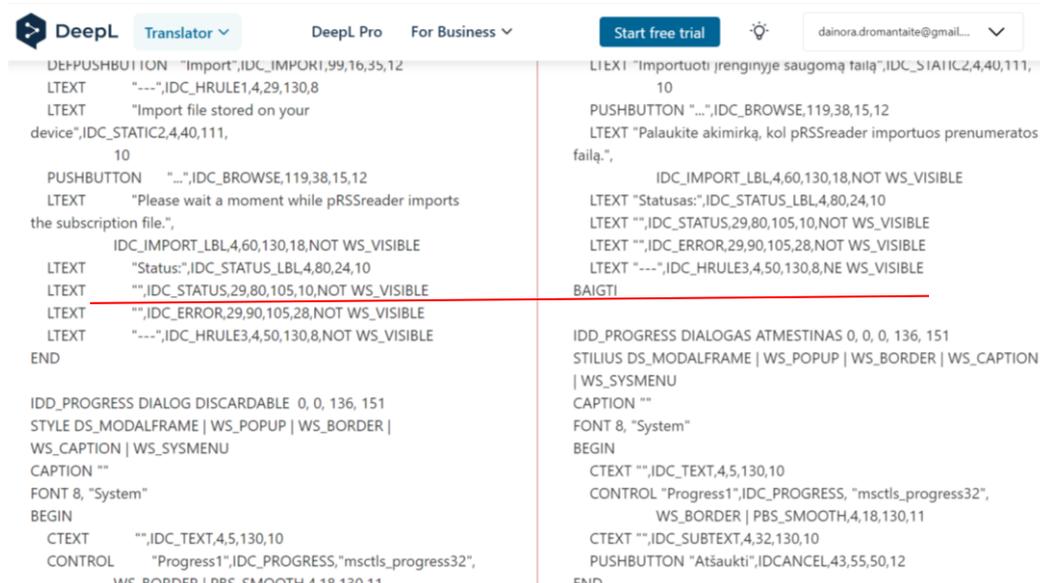
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Picture 3. *Google Translate screen from English into the Lithuanian language*



The underlined example of *Google Translate* illustrates the example of segment truncation when no spacing is used in between of the programming language and the segments to be localized. Visual comparison on the left and the right also demonstrates that the graphical layout of the resource file in the source and target languages was changed. Moreover, the programming element “CONTROL” is rendered as the Lithuanian equivalent “VALDYMAS”, though the segment should not be translated into the Lithuanian language at all.

Picture 4. *DeepL translate screen into the Lithuanian language*



The picture above presents the example from *DeepL*. It showcases that the machine translation tool does not support .txt or .rc2 extension files and having uploaded the .txt file as a .pdf file, the machine translated output file was similar to *Google Translate* file in terms of its graphical outlay. The localized resource file into the Lithuanian language contained different spacing, indentation and segmentation in comparison to the source file.

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However, *Vilnius University machine translation* tool recognized the .rc2 resource file but returned the output file with elements that should not be translated into the Lithuanian language. For instance, the item “8 FONT”, “CAPTION”, “BEGIN”, “END” and others were rendered into Lithuanian language as “8 ŠRIFTAS“, “KADRAS“, (Engl. *Picture/Shot/Frame*) “PRADĖTI” (Engl. *Start*) or “PABAIGA” (Engl. *End*) and such cases were numerous, as demonstrated in the picture below:

Picture 5. *VU machine translation tool translated output in the Lithuanian language*

```
////////////////////////////////////  
// Ištekliai  
  
////////////////////////////////////  
//  
// Dialogas  
//  
  
IDD_NEWS DIALOGO DISCARDABLE 0, 0, 139, 154  
STILIAUS DS_MODALFRAME | WS_POPUP | WS_VISIBLE | WS_SYSMENU | WS_CAPTION  
KADRAS „Naujienos“  
8 ŠRIFTAS, „Sistema“  
PRADĖTI  
LTEXT „, IDC_SITE_NAME, 0,0, 138,15, SS_CENTERIMAGE  
PABAIGA  
  
IDD_IMPORT_OPML DIALOGO DISCARDABLE 0, 0, 136, 151  
STILIAUS DS_MODALFRAME | WS_POPUP | WS_SYSMENU | WS_CAPTION  
ANTRAŠTĖ „Importuoti OPML failą“  
8 ŠRIFTAS, „Sistema“  
PRADĖTI  
LTEXT „Įveskite importuojamo OPML failo URL.“, IDC_STATIC1, 4,3,  
130,10  
EDITTEXT IDC_URL, 4,16,92,12, ES_AUTOHSCROLL  
DEFPUSHBUTTON „Importas“, IDC_IMPORT, 99,16,35,12  
LTEXT „--“, IDC_HRULE1, 4,29,130,8  
LTEXT „Importuoti jūsų prietaise saugomą failą“, IDC_STATIC2, 40,111,  
10  
MYGTUKAS „...“, IDC_BROWSE, 119,38,15,12  
LTEXT „Palaukite, kol pRSSreader importuos prenumeratos failą.“,  
IDC_IMPORT_LBL, 4,60,130,18, NE WS_VISIBLE  
LTEXT „Būsena:“, IDC_STATUS_LBL, 4,80,24,10  
LTEXT „, IDC_STATUS, 29,80,105,10, NE WS_VISIBLE  
LTEXT „, IDC_ERROR, 29,90,105,28, NE WS_VISIBLE  
LTEXT „--“, IDC_HRULE3, 4,50,130,8, NE WS_VISIBLE  
PABAIGA
```

The examination of the output file also revealed the fact that all the translatable segments were correctly detected by the machine translation tool. Yet, it failed to recognize some of the elements of the programming code. Still, it needs to be mentioned that the graphical layout, spacing, segmentation, and indentation of the target file were identical to the source file. The results might be related to the current technological improvements of the machine translation tool and the fact that it is further developed as a tool for webpage and software localization.

In terms of *Tildė machine translation tool*, an assumption was made that the machine translation tool should provide the best results due to the constant research and developments of the tool. The research and experiment demonstrated that the text’s layout was retained, but some programming elements were rendered into the Lithuanian language, damaging the programming code of the segments. The segments that were Lithuanised were the same segments that were also localized by other machine translation tools. For instance, “CAPTION” was translated as “ANTRAŠTĖ” (Engl. *Headline*), the item “8 FONT” as “8 ŠRIFTAS“, “BEGIN”, “END” as “PRADĖTI”

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(Engl. *Start*) or “PABAIGA” (Engl. *End*), “PUSHBUTTON” as “MYGTUKAS” (Engl. *Button*) and other. Yet, the output file contained no truncated segments and cases of different spacing, indentation or segmentation.

The comparison of the results of the four machine translation tools with the generative tool *ChatGPT* revealed the fact that the latter identified the translatable content and separated the programming language, however, the quality of the output file in terms of acceptability and usability was poor due to numerous lexical and grammatical mistakes or wrong terms. This might be related to the fact that the generative tool can generate both programming code and linguistic content. Yet, in terms of translation quality into the Lithuanian language, many improvements are needed so as to make the text usable and reader-friendly. Still, it is interesting to note that participants of the experiment copied separate segments that were produced by the tools to either *Notepad* or *Passolo* so as to speed up the process of localization. Since when the segments were copied from the machine translation outputs and pasted into the .txt file on *Notepad*, programming mistakes occurred. And when the files were aligned in *Passolo*, the segments were either truncated or presented incorrectly.

Picture 6. Tildė *machine translated output in the Lithuanian language*

```
////////////////////////////////////  
// ištekliai  
  
////////////////////////////////////  
//  
// dialogas  
//  
  
IDD_NEWS DIALOGO DISCARDABLE 0, 0, 139, 154  
STILIAUS DS_MODALFRAME | WS_KONTEKSTINIS MENIU | WS_VISIBLE | WS_CAPTION | WS_SYSMENU  
ANTRAŠTĖ „Naujienos“  
8 ŠRIFTAS, „System“  
PRADĖTI  
LTEXT „“, IDC_SITE_NAME, 0,0, 138,15, SS_CENTERIMAGE  
BAIGTI  
  
IDD_IMPORT_OPML DIALOGO DISCARDABLE 0, 0, 136, 151  
STILIAUS DS_MODALFRAME | WS_IŠŠOKANTIS LANGAS | WS_SUBTITRAI | WS_SYSMENU  
ANTRAŠTĖ „Importuoti OPML failą“  
8 ŠRIFTAS, „System“  
PRADĖTI  
LTEXT „Įveskite importuotino OPML failo URL.“, IDC_STATIC1, 4,3,  
130,10  
EDITTEXT IDC_URL, 4,16 92,12, ES_AUTOHSCROLL  
DEFPUSHBUTTON „Importuoti“, IDC_IMPORT, 99,16,35,12  
LTEXT „---“, IDC_HRULE1, 4,29,130,8  
LTEXT „Importuoti failą, saugomą jūsų prietaise“, IDC_STATIC2, 4,40,111,  
10  
MYGTUKAS „...“, IDC_BROWSE, 119,38,15,12  
LTEXT „Palaukite, kol pRSSreader importuos prenumeratos failą.“,  
IDC_IMPORT_LBL, 4,60,130,18, WS_VISIBLE  
LTEXT „būsena:“, IDC_STATUS_LBL, 4,80,24,10  
LTEXT „“, IDC_STATUS, 29,80,105,10, WS_VISIBLE  
LTEXT „“, IDC_ERROR, 29,90,105,28, WS_VISIBLE  
LTEXT „---“, IDC_HRULE3, 4,50,130,8, WS_VISIBLE  
BAIGTI
```

Considering the application of consistent terminology and the use of standardized Lithuanian terms, it was observed that *Tildė*'s output was the most consistent and fluent in terms of the correct and approved terminology use. Yet, all machine translation tools failed to use the recently standardized terms, as approved in the *Encyclopaedic Dictionary of Computer Terms* (2022), and their translation from English into the Lithuanian language. For instance, none of the machine translated outputs

rendered such words as “Manager” into the correct Lithuanian equivalent as “Tvarkytuvė“, “Reader” as the Lithuanian counterpart “Skaitytuvė“, “User” as “Naudotojas “ instead of “Vartotojas” (Engl. *Consumer*), or the button “Cancel” as “Atsisakyti” (Engl. *Refuse*) instead of another semantically close Lithuanian synonym “Atšaukti” (Engl. *Withdraw/Recall*), which is frequently confused with the latter. Here an assumption could be made that the machine translation tools failed to provide the right translation of the above-mentioned terms due to the fact that non-standardized terms are more often used in information and communication technologies related discourse in comparison with the approved ones. Programmers, computer specialists and software providers would apply non-standardized terms in the descriptions of their localized products, for instance, *Microsoft*. Moreover, it was interesting to observe that the participants of the experiment failed to recognize the improper use of the terms, mentioned above. The same mistakes of incorrect terminology or phrase use were observed in their final localizations of the resource file either in *Notepad* or *Passolo*. This might be related to the fact that they used the machine translation tools to translate the segments fast and since all of the four tools used the same and wrong Lithuanian counterparts, they did not question the correctness and validity of the terms used. Therefore, the same errors of incorrectly used terms were repetitive in the resource files that were localized using *Notepad* and *Passolo* programs.

The analysis of the machine-translated outputs also demonstrated inconsistencies in the correct language grammar use and style. All the machine translation tools failed to render the non-translatable items, such as “pRSSreader” or “ClearType”, into the Lithuanian language. The segments should have been Lithuanised by calque and partial localization when the item “pRSSreader” should be explained in terms of adding up the Lithuanian counterparts “Skaitytuvė” (Engl. *Reader*) next to the English item “pRSSreader” or “Mygtukas” (Engl. *Button*) next to the item “ClearType”. Moreover, the English words “pRSSreader” or “ClearType” in the segment “Enable ClearType” should have rendered into the Lithuanian language by placing them within the quotation marks. For instance, in the following segment “Palaukite, kol „pRSSreader“ importuos prenumeratos failą“ (Engl. *Please wait a moment while pRSSreader imports a subscription file*) the term “pRSSreader” should have been placed within the Lithuanian quotation marks due to the fact that the non-Lithuanian words have to be identified in a Lithuanian sentence.

In addition, cases where the output text does not correspond to the punctuation rules in terms of the fluency in the Lithuanian language are numerous. For example, the segment as produced by *VU translation tool* “Įveskite raktinį žodį (- US), JEI norite ieškoti:” (Engl. “*Enter keyword(s) to search for:*”) applies capital letters in the middle of the sentence, which is inappropriate for the Lithuanian language, since the interjection “Jei” (Engl., *If*) does not stand as a proper noun or an acronym that could be written using capital letters in the Lithuanian sentence. Moreover, the term “keywords” is

translated as “raktinis žodis” which is a literal translation from English into Lithuanian, yet, it should be replaced with another Lithuanian term “reikšminis žodis” (Engl. *notional/meaningful word*). And it is interesting to observe that the majority of participants of the experiment used inadequate translation of the English segment “keywords” and none of them selected the approved term “reikšminis žodis”.

Finally, the examination of accuracy and style of the outputs, produced by the machine translation tools, revealed the fact that all the machine translation tools provide rather accurate translations in terms of the message rendered in the Lithuanian language and recognise the genre of such technical texts. The style of the outputs produced was appropriate for this type of text, despite the fact that in some cases it could have been more coherent. For instance, the English segment “Import file stored on your device” was produced by *Tildē machine translation tool* applying the strategy of literal translation with slight modifications, i.e., “Importuoti failą, saugoma jūsų prietaise”. Though the Lithuanian counterpart, produced by the machine translation tool is correct, the style of the sentence and the word order could be replaced by the following sentence, i.e., “Importuoti įrenginyje saugomą failą” (Engl. *Import the file on the device*). Yet, the machine-translated segment is accurate and the translator could edit it by eliminating the Lithuanian pronoun “jūsų” (Engl. *Your*) and making its style more coherent. Such corrections would not require much of a cognitive effort of the translator in comparison to editing of lexical mistakes which requires more of the attention, precision, particularity and critical thinking of the translator.

Conclusions

The interest in machine translation tools, their usability, and different research on various aspects of machine translation tools is constantly increasing and revving up. Yet, the paper indicates that the research on the application of machine translation tools and their integration in processes of software localization for Lithuanian as the low-resourced language is rather limited and scarce during the period of this paper publication. Moreover, the investigation on how software localization into the Lithuanian language can be powered by machine translation tools is rather limited, despite the fact that some research has been carried out into the output quality of machine translated texts, examination of possible and practical challenges, and machine translation acceptance and usability from the perspective of Lithuanian users. Therefore, this paper is one of the first pilot studies to examine the usability of several machine translation tools in software Lithuanisation.

The experiment did not aim to provide specific statistical calculations of machine-made mistakes, but rather focused on the usability of the tools with 25 users who had to localize the resource file by means of *Notepad*, *Passolo* and the four machine translation tools. The results of the experiment demonstrated the fact that the participants, though

informed about the processes of the experiment, did use the machine translation tools in scenario 1, prior to the completion of scenario 2. This resulted in rather fast production of target files, yet the mistakes that occurred in the machine translated outputs were repetitively observed in all translations. This leads to a conclusion that when similarly translated segments are provided by different machine translation tools, translators do not necessarily critically evaluate the suggestions of the machine translation tools or double-check terminology, grammar, syntax, accuracy, and word use and instead trust the quality of the output produced.

The results of the research also demonstrated that in terms of the resource file recognition, *Tildė* and *VU machine translation* tools can handle and render .rc2 or .txt format files, while *Google Translate* and *DeepL* can deal with the mentioned format when the file is uploaded as a .pdf file. In terms of term consistency, accuracy, fluency, and style, *Tildė* translated machine translation output was the most cohesive and fluent. This might be related to the fact that the machine translation tool takes into account the aspects and peculiarities of the Lithuanian language. Furthermore, the tool is constantly technologically improved. Whereas *VU machine translation tool*, though developed mainly for the Lithuanian language, contains more mistakes, incorrect use of terminology and lacks text cohesion. However, further research needs to be carried out to statistically evaluate the percentage of mistakes and output quality, to provide more reliable and statistically grounded conclusions in terms of machine translation usability and integration in software localization for the Lithuanian language.

Furthermore, it must be mentioned that all four machine translation tools can be used in the process and workflow of resource file localization at the segment or string level. If rendered coherently and accurately, the segments could be edited and pasted into the screens of *Passolo* translators. Yet, attention should be paid when copying separate segments and making sure that when the machine-translated segment is copied, it is not truncated or presented incorrectly. In addition to that, the output of machine-translated segment and string should be double-checked to make sure that it is appropriate for the target language. This would require more time and effort; therefore, further research is needed to determine if such multitasking increases productivity of translators and localizers.

Bibliography

- Canfora, Carmen; Ottmann, Angelika. 2020. Risks in neural machine translation. *Transl. Spaces*. 9: 58–77.
- Castilho, Sheilla. 2016. *Measuring Acceptability of Machine Translated Enterprise Content*. Ph.D. Thesis, Dublin City University, Dublin, Ireland.
- Cvilikaitė, Jurgita. 2008. Leksinės mašininio vertimo klaidos: beekvivalenčių žodžių vertimas. *Filologija* 18. 27–38.
<https://talpykla.elaba.lt/elabafedora/objects/elaba:6138715/datastreams/MAIN/content>.
Accessed on: September 15, 2023.

- Maumevičienė, Dainora. 2023. Integration of Machine Translation Tools in Software Localization: mission (im)possible? In: L10N Journal 2(2), pp. 62–79.
- Daudaravičius, Vidas. 2006. Pradžia į begalybę. Mašininis vertimas ir lietuvių kalba. Darbai ir dienos, 45. 7–18. <https://www.cceol.com/search/article-detail?id=209872>. Accessed on: August 23, 2023.
- Das, P.; Kuznetsova, A.; Zhu, M.; Milanaik, R. 2019. Dangers of Machine Translation: The Need for Professionally Translated Anticipatory Guidance Resources for Limited English Proficiency Caregivers. Clin. Pediatr. 58: 247–249. PMID: 30392383.
- Dew, K.N.; Turner, A.M.; Choi, Y.K.; Bosold, A.; Kirchhoff, K. 2018. Development of machine translation technology for assisting healthcommunication: A systematic review. J. Biomed. Inform., 85, 56–67.
- Doherty, Stephen. 2016. The Impact of Translation Technologies on the Process and Product of Translation. <https://ijoc.org/index.php/ijoc/article/viewFile/3499/1573>. Accessed on: September 15, 2023.
- Enciklopedinis kompiuterijos terminų žodynas //Encyclopaedic Dictionary of Computer Terms. 2022. <http://www.ims.mii.lt/ALK%C5%BD/angl.html>.
- European Commission. 2022. European Master's in Translation Competence Framework. https://commission.europa.eu/system/files/2022-11/emt_competence_fwkc_2022_en.pdf. Accessed on: October 15, 2023.
- Gaspari, F.; Almaghout, H.; Doherty, S. 2015. A survey of machine translation competences: Insights for translation technology educators and practitioners. Perspectives. 23: 333–358.
- Hoi, Huynh, Tan. 2020. Machine Translation And Its Impact In Our Modern Society. Int. J. Sci. Technol. Res. 9, 1918–1921. https://www.researchgate.net/publication/341650157_Machine_Translation_And_Its_Impact_In_Our_Modern_Society. Accessed on: September 20, 2023.
- Kasperavičienė, Ramunė; Motiejūnienė, Jurgita; Patašienė, Irena. 2020. Quality Assessment of Machine Translation Output: Cognitive Evaluation Approach in An Eye-Tracking Experiment. Texto Livre: Linguagem e Tecnologia, 13(2). 271–285. <https://doi.org/10.35699/1983-3652.2020.24399>.
- Kasperė, Ramunė; Horbačasienė, Jolita; Motiejūnienė, Jurgita; Liubinienė, Vilmantė; Patašienė, Irena; Patašius, Martynas. 2021. Towards sustainable use of machine translation: usability and perceived quality from the end-user perspective // Sustainability. Basel : MDPI. ISSN 2071-1050. 2021, vol. 13, iss. 23, art. no. 13430, p. 1-17. DOI: 10.3390/su132313430.
- Kenny, Dorothy; Moorkens, Joos; do Carmo, Felix. 2020. Fair MT: Towards ethical, sustainable machine translation. Transl. Spaces 2020, 9, 1–11.
- Labutis, Vitas. 2005. Išaugusi vertėjų paklausa–nauji pavojai lietuvių kalbai. Bendrinė kalba (iki 2014 metų–Kalbos kultūra), 78. 205–209. <https://www.cceol.com/search/arti-cle-detail?id=93919>. Accessed on: August 23, 2023.
- Lommel, Arle; Burchardt, Aljoscha; Uszkoreit, Hans. 2014. Multidimensional Quality Metrics (MQM): A framework for declaring and describing translation quality metrics. Tradumàtica: tecnologies de la traducció, 0:455–463.
- Petkevičiūtė, Inga; Tamulynas, Bronius. 2011. Kompiuterinis vertimas į lietuvių kalbą: alternatyvos ir jų lingvistinis vertinimas. Kalbų studijos 18. 38–45. <https://etalpykla.lituanistikadb.lt/object/LT-LDB-0001:J.04~2011~1367174892606/>. Accessed on: August 23, 2023.
- Pituxcoosuvarn, Mondheera; Ishida, Toru. 2018. Multilingual communication via best-balanced machine translation. New Gener. Comput. 36, 349–364.
- Rimkutė, Erika; Kovalevskaitė, Jolanta. 2007. Mašininis vertimas–greitoji pagalba globalėjančiam pasauliui. Gimtoji kalba, 9. 3–10. <http://donelaitis.vdu.lt/lkk/pdf/MV2.pdf>. Accessed on: June, 2023.
- Rimkutė, Erika; Kovalevskaitė, Jolanta. 2008. Linguistic Evaluation of the First English-Lithuanian Machine Translation System. Proceedings of the Third Baltic Conference on Human Language Technologies. Vytautas Magnus University, Institute of the Lithuanian Language, 257–264.

Maumevičienė, Dainora. 2023. Integration of Machine Translation Tools in Software Localization: mission (im)possible? In: L10N Journal 2(2), pp. 62–79.

- Rossetti, A.; O'Brien, S.; Cadwell, P. 2020. Comprehension and Trust in Crises: Investigating the Impact of Machine Translation and Post-Editing. In Proceedings of the 22nd Annual Conference of the European Association for Machine Translation, Lisbon, Portugal, 3–5 November 2020; European Association for Machine Translation: Lisboa, Portugal, 2020; pp. 9–18.
- Rossi, Caroline; Chevrot, Jean-Pierre. 2019. Uses and perceptions of Machine Translation at the European Commission. *J. Spec. Transl. (JoSTrans)*.31: 117-200.
- Saadany, H.; Orasan, C.; Quintana, R.C.; do Carmo, F.; Zilio, L. 2021. Challenges in Translation of Emotions in Multilingual User-Generated Content: Twitter as a Case Study. arXiv, arXiv:2106.10719.
- Skadiņa, Iguna. 2019. Some Highlights of Human Language Technology in Baltic Countries. In Databases and Information Systems X: Selected Papers from the Thirteenth International Baltic Conference, DB&IS 2018. Vol. 315. ISOS Press: pp.18-32.
- Skadiņš, Raivis; Pinnis, Marcis; Vasiļjevs, Andrejs; Skadiņa, Iguna; Hudik, Toma. 2014. Application of Machine Translation in Localization into Low-Resourced Languages. <http://aclanthology.lst.uni-saarland.de/2014.eamt-1.43.pdf>. Accessed on: September 1, 2023.
- Utkā, Andrius; Amilevičius, Darius; Krilavičius, Tomas; Vitkutė-Adžgauskienė, Daiva. 2016. Overview of the Development of Language Resources and Technologies in Lithuania (2012–2015). In Human language technologies - the Baltic perspective: proceedings of the 7th international conference, Baltic HLT 2016, Riga; pp. 12–19.
- Utkā, Andrius; Vaičėnonienė, Jurgita; Briėdienė, Monika; Krilavičius, Tomas. 2020. Development and Research in Lithuanian Language Technologies (2016–2020). In Human language technologies - the Baltic perspective: proceedings of the 9th international conference, Baltic HLT 2020, Kaunas; Amsterdam : IOS Press; pp.215–222.
- Yamashita, Naomi; Ishida, Toru. 2006. Effects of Machine Translation on Collaborative Work. In Proceedings of the 2006 20th Anniversary Conference on Computer Supported Cooperative Work (CSCW '06), Banff, AB, Canada, 4–8 November 2006; Association for Computing Machinery: New York, NY, USA; pp. 515–524.
- Yasuoka, M.; Bjorn, P. 2011. Machine Translation Effect on Communication: What Makes It Difficult to Communicate through Machine Translation? In Proceedings of the 2011 Second International Conference on Culture and Computing, Kyoto, Japan, 20–22 October 2011; pp. 110–115.

Reviews

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In the rapidly evolving field of machine translation (MT), the intersection between technological advancement and ethical, legal, and societal considerations has become a focal point of academic and professional discourse. *Towards Responsible Machine Translation – Ethical and Legal Considerations in Machine Translation*, edited by Helena Moniz and Carla Parra Escartín, is a groundbreaking compilation that addresses these issues. The interdisciplinary approach of this volume, combining philosophy, law, computational linguistics, and data science, provides a comprehensive overview of the ethical and legal challenges in MT.

The structure of the book is organized into three parts, each of which examines different facets of machine translation from theoretical, practical, and societal perspectives. This tripartite structure not only categorizes the broad spectrum of considerations but also enables a deeper understanding of the multifaceted nature of machine translation. Each chapter provides an insightful examination, together painting a comprehensive, nuanced picture of the current state and future directions of responsible use of MT.

Part I, *Responsible Machine Translation: Ethical, Philosophical, and Legal Aspects*, serves as the foundational core, where readers are introduced to the legal and ethical quandaries and philosophical considerations that underpin the development and application of MT technologies. It includes thought-provoking articles such as Wessel Reijers and Quinn DuPont's examination of contemporary ethics in MT (*Prolegomenon to Contemporary Ethics of Machine Translation*) and Mikel L. Forcada's analysis of copyright and licensing issues (*Licensing and Usage Rights of Language Data in Machine Translation*), setting the stage for a deep dive into the ethical implications of MT.

The chapter *Authorship and Rights Ownership in the Machine Translation Era* by Miguel L. Lacruz Mantecón highlights the issues discussed in Part I by addressing the intellectual property in the age of algorithms, which are able to produce translations that rival human efforts. The chapter examines the legal and ethical challenges surrounding machine-generated translation ownership, providing thoughtful strategies for

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addressing these complex issues. Lacruz Mantecón advocates for a nuanced understanding of authorship that recognizes the contributions of both human and machine, suggesting a path forward, which respects intellectual property rights while accounting for the realities of machine-assisted translation.

Adding to the discourse, Part II, *Responsible Machine Translation from the End-User Perspective*, shifts the focus towards the experiences and ethical considerations from the perspective of those who interact with MT on a daily basis. This section discusses the broader impact of MT on end-users, including the ethical use of MT in crisis situations (*Ethics, Automated Processes, Machine Translation and Crises*, Federico M. Federici, Christophe Declercq, Jorge Díaz Cintas and Rocío Baños Piñero), highlighting the importance of maintaining ethical standards in the practical application of MT technologies.

The chapter *The Ethics of Machine Translation Post-editing in the Translation Ecosystem* by Celia Rico and María del Mar Sánchez Ramos underscores the points discussed in Part II by offering an in-depth look at the ethical considerations surrounding machine-translated content's post-editing process. This contribution examines the evolving role of human translators in the MT workflow, highlighting the ethical dilemmas they face, such as the undervaluation of their cognitive labor and the challenges in ensuring translation quality in a machine-dominated environment. It highlights a crucial aspect of the ethical debate in MT: the need to reassess the value and recognition of human input in an era dominated by machine efficiency. In doing so, Rico and Sánchez Ramos not only contribute to understanding the ethical dilemmas inherent in the post-editing process but also advocate for a fairer consideration of human expertise within the MT workflow. This chapter enriches the book's examination of the practical and ethical issues faced by end-users by providing a thorough analysis of the interplay between human capabilities and automated technologies, advocating for a balanced approach that respects and values the indispensable human element in translation.

Part III, *Responsible Machine Translation: Societal Impact*, contemplates the broader implications of MT for society, addressing issues such as the potential for gender and age biases in commercial MT systems, as discussed by Federico Bianchi, Tommaso Fornaciari, Dirk Hovy, and Debora Nozza (*Gender and Age Bias in Commercial Machine Translation*). This section also includes Dimitar Shterionov and Eva Vanmassenhove's examination of the ecological footprint of neural MT systems, discussing the environmental costs associated with the energy consumption of training and running these advanced AI models, highlighting the urgent need for sustainable practices in the development of MT technologies (*The Ecological Footprint of Neural Machine Translation Systems*). Through these discussions, Part III highlights the significant societal responsibilities that accompany the advancement of MT technologies and the need to address them for the benefit of all.

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The chapter *Treating Speech as Personally Identifiable Information and Its Impact in Machine Translation*, authored by Isabel Trancoso, Francisco Teixeira, Catarina Botelho, and Alberto Abad, addresses the pressing privacy and security concerns in speech-to-speech machine translation. As speech and language technologies become more widespread, the risk of data breaches and misuse of personal data increases. The authors highlight the unique challenges of anonymizing speech data, the risks of reconstructing personal voices from speech input, and the broader implications for user privacy. This discussion is particularly timely, as it reflects the growing awareness of the need to protect individuals' rights in the digital age. The chapter significantly contributes to Part III's theme by delving into the complex interplay between technology and privacy, offering critical insights into how machine translation technologies can be developed and used without compromising personal privacy, thereby emphasizing the need for stringent privacy measures and ethical considerations in the advancement of MT systems.

Overall, *Towards Responsible Machine Translation* is a valuable resource for anyone interested in the intersection of technology, language, and ethics. The editors have succeeded in compiling a work that is both intellectually sound and highly relevant to current debates about the future of MT. Its contributions lay the foundation for further research and discussion on addressing the ethical and legal challenges of responsible and equitable use of MT.

The book's exploration of topics such as copyright, authorship, privacy, and the environmental impact of MT systems is particularly commendable, offering readers a comprehensive understanding of the complexity and breadth of issues at stake. As MT continues to permeate more aspects of our lives, the insights offered in this collection will be crucial for guiding the development of technologies that are not only effective but also ethical and legally compliant. In this respect, *Towards Responsible Machine Translation* is not just a reflection on where we stand but also a beacon for where we need to go.

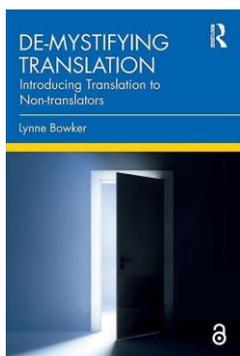
Final Variable

This section highlights noteworthy publications in translation studies and disciplines related to the scope of the journal. In addition to three books, this *Final Variable* also features a special journal issue relevant to the topics discussed. Two of the books were also chosen for their accessibility and general public-friendliness, as they were written with non-academics in mind but still offer valuable insight into their respective topics.



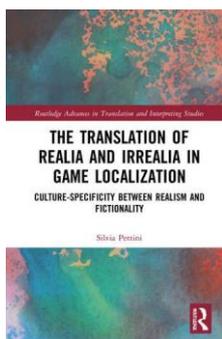
The Special Issue on Translation Automation and Sustainability (2024) in *The Journal of Specialised Translation*, edited by David Orrego-Carmona, explores the intersection between translation and technologies. This issue offers a fruitful video discussion between the co-editors, 9 innovative articles on various topics regarding machine translation post-editing, speech-to-text recognition, and translation quality evaluation, and 5 in-depth book reviews.

<https://www.jostrans.org/issue/view/492>



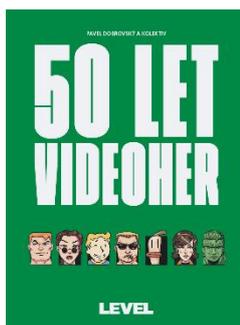
Lynne Bowker's *De-mystifying Translation* (2023) is an extensive introduction to translation for aspiring translation students and anyone interested in translation. The author lays out all the necessary foundations of translation, as well as an introduction to the history of translation, machine translation, localization, transcreation, and much more, making it a perfect starting point for the general public and academics alike.

<https://doi.org/10.4324/9781003217718>



The Translation of Realia and Irrealia in Game Localization (2022) by Silvia Pettini takes a thorough look at the localization challenges posed by realism and fictionality in video games and their solutions through an interdisciplinary approach. The research focuses on three war video games but provides deep insight into obstacles video game localizers run into in general.

<https://doi.org/10.4324/9781003001935>



50 Years of Video Games (2023) is an accompanying book to *About Games and People* (2022) by the editors of the gaming magazine *Level*, this time focusing on the history of game development by dedicating several pages of facts, interviews, and development stories to some of the most important video games in history and noting their influence on the industry as a whole.

<https://www.xzone.sk/kniha-level-50-let-videoher>

